Bay Area 2005 Ozone Strategy

Draft Program Environmental Impact Report

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Volume I

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BAY AREA 2005 OZONE STRATEGY

DRAFT PROGRAM ENVIRONMENT IMPACT REPORT

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1.0 INTRODUCTION AND EXECUTIVE SUMMARY

1.1 INTRODUCTION

The Bay Area Air Quality Management District (BAAQMD or Air District) was established in 1955 by the California Legislature to control air pollution in the counties around San Francisco Bay, to attain air quality standards by the dates specified in State and federal law. There have been significant improvements in air quality in the Bay Area over the last several decades. Ozone conditions in the Bay Area have improved significantly over the years. Ozone levels – as measured by peak concentrations and the number of days over State or national standards – have declined substantially as a result of aggressive programs by the Air District, MTC and other regional, State and federal partners. In fact, in April 2004 the U.S. Environmental Protection Agency (U.S. EPA) determined that the region had attained the national one-hour ozone standard. U.S. EPA recently transitioned from the national one-hour standard to a more health protective 8-hour standard. The 8-hour standard took effect in June 2004, and the federal one-hour standard was revoked on June 15, 2005.

However, there is still a need for continued improvement of air quality in the Bay Area. The Air District is required to meet State standards by the earliest date achievable through the implementation of all feasible measures. Therefore, in order to attain the more stringent State ozone standard, the region must continue its long-term progress in reducing ozone levels. The Air District will continue to adopt regulations, implement programs and work cooperatively with other agencies, organizations and the public on a wide variety of strategies to improve air quality in the region. The 2005 Ozone Strategy provides a detailed description of how the Bay Area plans to achieve these goals.

The California Clean Air Act (CCAA), adopted in 1988, requires the BAAQMD to develop and periodically update, a plan to achieve and maintain State ambient air quality standards for ozone, CO, sulfur dioxide (SO_2), and NO_2 by the earliest practicable date (Health & Safety Code §40910). The Bay Area has attained the CO, SO2 and NO2 standards. Because the region violates the State one-hour ozone standard, the Bay Area is considered a nonattainment area for the State standard. The CCAA requires regions that do not meet the State ozone standard to prepare plans for attaining the standard and to update these plans every three years. These plans must include estimates of current and future emissions of the pollutants that form ozone (ozone precursors) and a control strategy that includes "all feasible measures" to reduce these emissions. The plans must also include measures to reduce transport of ozone and ozone precursors to downwind regions.

The 2005 Ozone Strategy is the latest triennial update to the Bay Area strategy to achieve the State ozone standard, including new control measures. The control measures are proposed to satisfy State ozone planning requirements. The requirements for meeting the State and national standards are separate and distinct, and this document does not in any way merge the two standards or the requirements under each standard.

The 2005 Ozone Strategy has been prepared by the Air District, in consultation with the Metropolitan Transportation Commission (MTC) and the Association of Bay Area Governments (ABAG). The Air District Board of Directors will consider adoption of the 2005 Ozone Strategy and, upon adoption, will transmit it to the California Air Resources Board for their review and approval.

1.1.1 CALIFORNIA ENVIRONMENTAL QUALITY ACT

The California Environmental Quality Act (CEQA), Public Resources Code Section 21000 et seq., requires that the potential environmental impacts of proposed projects be evaluated and that feasible methods to reduce or avoid identified significant adverse environmental impacts of these projects be identified.

To fulfill the purpose and intent of CEQA, the BAAQMD has prepared this Program Environmental Impact Report (EIR) to address the potential environmental impacts associated with the proposed 2005 Ozone Strategy. Prior to making a decision on the 2005 Ozone Strategy, the BAAQMD Board of Directors must review and certify the EIR as providing adequate information on the potential adverse environmental impacts of implementing the proposed 2005 Ozone Strategy.

1.1.2 NOTICE OF PREPARATION

A Notice of Preparation for the Bay Area 2005 Ozone Strategy EIR (included as Appendix A of this EIR) was distributed to responsible agencies and interested parties for a 30-day review on May 1, 2004. A notice of the availability of this document was distributed to other agencies and organizations and was placed on the BAAQMD's web site, and was also published in newspapers throughout the area of the BAAQMD's jurisdiction. Nine comment letters were submitted on the NOP and are included in Appendix B of this EIR.

1.1.3 TYPE OF EIR

CEQA provisions for program EIRs in connection with issuance of rules, regulations, plans, or other general criteria to govern the conduct of a continuing program, including adoptions of broad policy programs are separate from the provisions of EIRs prepared for specific types of projects (e.g., land use projects) (CEQA Guidelines §15168). The EIR for the 2005 Ozone Strategy is a program EIR because it examines the environmental effects of proposed control measures that will ultimately be implemented through rules, or regulations and related programs promulgated as part of a continuing ongoing regulatory program.

A program EIR allows consideration of broad policy alternatives and program-wide mitigation measures at a time when an agency has greater flexibility to deal with basic problems of cumulative impacts. A program EIR also plays an important role in establishing a structure within which CEQA reviews of future related actions can be effectively conducted. This concept of covering broad policies in a program EIR and

incorporating the information contained therein by reference into subsequent EIRs for specific projects is known as "tiering" (CEQA Guidelines §15152). A program EIR will provide the basis for future environmental analyses and will allow project-specific CEQA documents to focus solely on the new effects or detailed environmental issues not previously considered. If an agency finds that no new effects could occur, or no new mitigation measures would be required, the agency can approve the activity as being within the scope of the project covered by the program EIR, and no new environmental document would be required (CEQA Guidelines §15168(c)[5]).

The degree of specificity required in an EIR corresponds to the degree of specificity involved in the underlying activity described in the EIR (CEQA Guidelines §15146). Because the level of information regarding potential impacts from control measures recommended in the 2005 Ozone Strategy is relatively general at this time, the environmental impact forecasts are also general or qualitative in nature. In certain instances, such as future ambient air quality concentrations, impacts are quantified to the degree feasible.

1.1.4 INTENDED USES OF THIS DOCUMENT

In general, a CEQA document is an informational document that informs a public agency's decision-makers, and the public generally, of potentially significant adverse environmental effects of a project, identifies possible ways to avoid or minimize the significant effects, and describes reasonable alternatives to the project (CEQA Guidelines §15121). A public agency's decision-makers must consider the information in a CEQA document prior to making a decision on the project. Accordingly, this EIR is intended to: (a) provide the BAAQMD Board of Directors and the public with information on the environmental effects of the proposed project; and, (b) be used as a tool by the BAAQMD Board to facilitate decision making on the proposed project.

Additionally, CEQA Guidelines §15124(d)(1) requires a public agency to identify the following specific types of intended uses of a CEQA document:

1. A list of the agencies that are expected to use the EIR in their decision-making;

2. A list of permits and other approvals required to implement the project; and

3. A list of related environmental review and consultation requirements required by federal, state, or local laws, regulations, or policies.

Local public agencies, such as cities, and counties could be expected to tier off this EIR when considering land use and planning decisions related to projects that implement a control measure in the 2005 Ozone Strategy, pursuant to CEQA Guidelines §15152. There is no State, federal or local permits required to adopt the 2005 Ozone Strategy. However, implementation of some of the control measures will require various permits from all levels of government. The Notice of Preparation (NOP) for this EIR was

distributed to a comprehensive list of affected parties, including federal, state and local environmental agencies and other interested stakeholders.

1.1.5 AREAS OF POTENTIAL CONTROVERSY

In accordance with CEQA Guidelines §15123(b)(2), the areas of controversy known to the lead agency including issues raised by agencies and the public shall be identified in the EIR. Table 1-1 highlights the areas of controversy raised by the public during the NOP public comment period. Specific issues raised by the public on compliance, attainment or maintenance for the federal one-hour ozone standard have not been included in Table 1-1 because the 2005 Ozone Strategy does not address compliance with the federal one-hour ozone standard.

TABLE 1-1

Areas of Controversy

AREA OF CONTROVERSY		TOPICS RAISED BY PUBLIC	BAAQMD EVALUATION
1.	Land Use	Developer based trip reduction ordinances should be reviewed to mitigate impacts on land use.	TCM 15 is included in the Ozone Strategy and would provide local land use planning and development strategies that would include indirect source mitigation.
		Air District should do more to promote smart growth principles and enhance public transit opportunities.	TCM 15 includes local land use planning and development strategies to encourage smart growth. A number of TCMs will enhance public transt opportunities (see TCMs 1, 3, 4, 5, 6, 7, 8, 13, 14, 18 and 19).
2.	Transportation	TCM 8 should be reviewed to determine the feasibility for revising the occupancy requirements and time restrictions for HOV lanes.	The MTC periodically reviews HOV lane performance and updates the Bay Area HOV Lane Master Plan. Recommended HOV lane improvements are then included in the RTP. The MTC will continue to review HOV lane performance data and make adjustments, as needed.
3.	Air Quality	All reasonably available NOx controls should be included.	All feasible NOx controls have been included in the 2005 Ozone Strategy. See Chapter 2, Subchapter 2.3.1 for a further discussion.
		The EIR must identify the potential environmental consequences of exceedences during the 2004 ozone season.	This comment was made prior to the completion of the 2004 ozone season. The 2005 Ozone Strategy now includes monitoring data for the State 1-hr ozone standard during the 2004 ozone season.
		Secondary impacts of pursuing a VOC only control strategy and not controlling NOx emissions should be evaluated.	Secondary impacts of the Ozone Strategy have been addressed in Chapter 3 of this EIR. The 2005 Ozone Strategy includes both VOC and NOx controls so the impact of a VOC only control strategy is not relevant.

TABLE 1-1 (Cont.)

AREA OF CONTRO-VERSY		TOPICS RAISED BY PUBLIC	BAAQMD EVALUATION
	Air Quality (cont)	Ozone Strategy must include all feasible measures.	As required by the CCAA, all feasible control measures have been included. The process for identification of control measures is included in Chapter 2 of the EIR.
		Consider the reasons that the federal 1-hr ozone standard was met in the early 1990's but then increases in ozone were observed.	The 2005 Ozone Strategy addresses the Bay Area's planning requirements with regards to the State 1-hr ozone standard. This comment was made when the District was preparing a combined State and federal report.
4.	Cumulative Impacts	The Air District should broaden the scope of the EIR to ensure that cumulative effects and public health effects are disclosed.	Cumulative impacts are discussed for each environmental topic in the EIR. Public health impacts are not identified separately but are included under the discussion of air quality. Further reduction in ozone concentrations are expected to provide beneficial health impacts.
5.	Environmental Impacts	The CEQA document must address the full range of impacts associated with the Ozone Strategy	All environmental resources included in the CEQA checklist form are included in this EIR.
6.	Baseline	The EIR should look at a "normal baseline"	The environmental setting used in the EIR is consistent with the CEQA Guidelines §15125(a).
7.	Alternatives	The EIR must evaluate a range of alternatives.	Chapter 4 of this EIR includes an alternatives analysis.
8.	Ozone Transport	All feasible control measures must be included in the Ozone Plan to minimize the downwind impacts on other air basins.	All feasible controls have been included in the 2005 Ozone Strategy. See Chapter 2, Subchapter 2.3.1 for a further discussion.
		Include analysis of the impacts of ozone transport into downwind areas.	The impacts on transport into downwind areas has been included in Chapter 3 of the EIR.
9.	Environmental Justice	Environmental Justice issues must be specifically addressed.	Environmental justice issues are not specifically addressed in the EIR, and they are not required to be included. The potential impacts of the Ozone Strategy have been evaluated for all environmental resources required under the CEQA Guidelines. The overall impact of the Ozone Strategy is reduced NOx and ROG emissions and a subsequent decrease in ozone concentrations and reduce public exposure to unhealthy ozone levels
10.	Project Description	The Project description must include a discussion of the control measures.	The control measures are summarized in Chapter 2 of this EIR.

It should be noted that a number of the comments received in response to the NOP raise issues regarding the content of the Strategy, and will be addressed in that context; they do not raise CEQA issues. That is, they do not address potential significant adverse environmental impacts of the Strategy or the individual control measures; do not suggest or raise other issues regarding mitigation of those impacts; do not suggest or raise other issues regarding alternatives to eliminate or reduce those impacts; or otherwise raise issues related to the adequacy of the environmental review.

1.1.6 PROJECT OBJECTIVES

CEQA Guidelines §15124(b) requires an EIR to include a statement of objectives, which describes the underlying purpose of the proposed project. The purpose of the statement of objectives is to aid the lead agency in identifying alternatives and the decision-makers in preparing a statement of findings and a statement of overriding considerations, if necessary. The objectives of the proposed 2005 Ozone Strategy are summarized in the following bullet points.

- Comply with the 1988 California Clean Air Act requirements including:
  1. Apply best available retrofit control technology (BARCT);
  2. Implement all feasible measures through an expeditious implementation schedule;
  3. Reduce population exposure to ozone and its precursors according to a prescribed schedule;
  4. Provide for the attainment of the State ozone ambient air quality standard at the earliest practicable date.
- Comply with transport mitigation requirements in Health and Safety Code §40912.

1.1.7 DOCUMENT FORMAT

State CEQA Guidelines outline the information required in an EIR, but allow the format of the document to vary [CEQA Guidelines §15120(a)]. The information in the EIR complies with CEQA Guidelines §15122 through §15131 and consists of the following:

Chapter 1: Introduction

Chapter 2: Project Description

Chapter 3: Environmental Setting, Impacts and Mitigation Measures

Chapter 4: Alternatives

Chapter 5: Other CEQA Topics

Chapter 6: References

Chapter 7: Acronyms

Appendix A: Notice of Preparation/Initial Study

Appendix B: Comments Received on the Notice of Preparation (NOP)/Initial Study and Responses to Comments

Appendix C: Landfill Information

1.2 EXECUTIVE SUMMARY OF DRAFT EIR

1.2.1 EXECUTIVE SUMMARY – CHAPTER 2: PROJECT DESCRIPTION

Implementation of the 2005 Ozone Strategy requires a cooperative partnership of governmental agencies at the federal, state, regional and local level. At the federal level, the U.S. EPA is charged with regulation of on-road motor vehicles; trains, airplanes, and ships; certain non-road engines; and off-shore oil development. The California Air Resources Board (CARB) also regulates on-road mobile sources and the fuel used in those sources, some off-road sources, and consumer products. At the regional level, the Metropolitan Transportation Commission (MTC) and the Association of Bay Area Governments (ABAG) would be responsible for implementing transportation control measures and or recommending land use control measures to reduce vehicle emissions throughout the Bay Area. In addition, the BAAQMD has primary responsibility for the development of the 2005 Ozone Strategy and is responsible for regulating stationary sources and implementing programs focused on some mobile sources. At the local level, cities and counties would be responsible for implementing various control measures through the adoption of model ordinances or through their discretionary land use authority.

When the Air District (and other California air districts) adopts plans to meet State air quality planning requirements, these plans are then submitted to CARB to be included in the statewide program to achieve air quality standards. Thus, upon adoption of the 2005 Ozone Strategy by the Air District, the document will be submitted to CARB for review and approval.

The control strategy for the 2005 Ozone Strategy is to implement all feasible measures on an expeditious schedule in order to reduce emissions of ozone precursors. This is consistent with CCAA requirements in the Health and Safety Code and pollutant transport mitigation requirements in the California Code of Regulations. The control strategy includes stationary source measures, mobile sources measures and transportation control measures.

There are 15 stationary source measures proposed for the 2005 Ozone Strategy. Most stationary source measures in the 2005 Ozone Strategy will be implemented through rule making. The BAAQMD goes through a detailed process to develop and adopt rules and

regulations to impose standards on, and limit emissions from, stationary sources of emissions in the Bay Area.

The term "mobile source", as used in the CCAA and by the Air District, refers collectively to vehicular sources and other non-stationary sources. Mobile sources are defined in the CCAA as self-propelled devices that may travel upon a highway, including automobiles, trucks, construction equipment, farm equipment, and off-road vehicles. "Non-vehicular" mobile sources or "non-road" sources as they are defined in the federal CAA, include ships, boats, aircraft, locomotives, and lawn and garden equipment. Mobile sources are by far the largest sources of ozone precursors. Four mobile source control measures are included in the 2005 Ozone Strategy.

The CCAA places great emphasis on transportation control measures. The CCAA's legislative intent states that in developing attainment plans, air districts shall "focus particular attention on reducing the emissions from transportation and areawide emission sources" (Sec. 40910). The CCAA specifically requires air districts to "adopt, implement and enforce transportation control measures." Transportation Control Measures (TCMs) are defined as "any strategy to reduce vehicle trips, vehicle use, vehicle miles traveled, vehicle idling, or traffic congestion for the purpose of reducing motor vehicle emissions." (Sec. 40717). TCMs must be sufficient to substantially reduce the rate of increase in vehicle trips and vehicle miles traveled (Sec. 40918). Nineteen TCMs are included in the 2005 Ozone Strategy.

1.2.2 EXECUTIVE SUMMARY – CHAPTER 3: ENVIRONMENTAL SETTING, IMPACTS AND MITIGATION MEASURES

CEQA Guidelines §15125(a) requires that an EIR include a description of the physical environmental conditions in the vicinity of the project, as they exist at the time the NOP is published. This environmental setting will normally constitute the baseline of physical conditions by which a lead agency determines whether an impact is significant. The description of the environmental setting shall be no longer than is necessary to an understanding of the significant effects of the proposed project and its alternatives.

The CEQA Guidelines also require EIRs to identify significant environmental effects that may result from a proposed project [CEQA Guidelines §15126.2(a)]. Direct and indirect significant effects of a project on the environment should be identified and described, with consideration given to both short- and long-term impacts. If significant adverse environmental impacts are identified, the CEQA Guidelines require a discussion of measures that could either avoid or substantially reduce any adverse environmental impacts to the greatest extent feasible (CEQA Guidelines §15126.4).

Chapter 3 describes the existing environmental setting, analyzes the potential environmental impacts, and recommends mitigation measures, when significant environmental impacts have been identified. In addition, cumulative impacts and

mitigation are also addressed. Each of the resources identified in the CEQA checklist (CCR Title 14, Chapter 3, §15000 et seq., Appendix G) are analyzed in Chapter 3.

Every control measure in the 2005 Ozone Strategy was evaluated to determine whether or not it has the potential to generate adverse environmental impacts. A potentially significant impact related to hazards and hazardous materials was identified due to the possible use of anhydrous ammonia with the implementation of stationary source control measure SS 14 – Stationary Gas Turbines. Potentially significant impacts (after mitigation) were identified for a number of the TCMs including aesthetics, localized air quality, biological resources, cultural resources, transportation and traffic, and utilities and service system. TCM impacts on hazards and hazardous materials, hydrology and water quality, and noise were determined to be less than significant following mitigation. Most of the potentially significant impacts are associated with the construction and operation of new transit stations and facilities for rail, bus and ferries. A summary of the potential impacts for each control measure is provided in Table 1-2 included at the end of this chapter. The impacts on other environmental resources were determined to be less than significant.

1.2.3 EXECUTIVE SUMMARY – CHAPTER 4: ALTERNATIVES

This EIR provides a discussion of alternatives to the proposed project as required by CEQA. According to the CEQA guidelines, alternatives should include realistic measures to attain the basic objectives of the proposed project and provide means for evaluating the comparative merits of each alternative (CEQA, Guidelines, § 15126.6(a)). In addition, though the range of alternatives must be sufficient to permit a reasoned choice, they need not include every conceivable project alternative (CEQA Guidelines §15126.6(a)).

The possible alternatives to the proposed 2005 Ozone Strategy are limited by the nature of the project. The CCAA requires the BAAQMD to reduce pollutants contributing to non-attainment to the maximum extent feasible. As such, the proposed 2005 Ozone Strategy, and any acceptable project alternatives, must comply with this criterion to attain the basic objectives of the project. Consequently, all viable project alternatives must include at a minimum all the control measures identified in the 2005 Ozone strategy.

CEQA requires a No Project Alternative to be evaluated. A No Project Alternative consists of what would occur if the project were not approved. In this case, the no project alternative refers to the BAAQMD taking no further action to meet its one-hour ozone obligations under the CCAA with the exception of continuing to adopt rules and regulations contained in the 2000 CAP. Of course, individual control measures can be adopted at any time as long as the required environmental review is completed before the project is implemented.

The No Project Alternative would not ultimately achieve the long-term benefits of the 2005 Ozone Strategy, and is not a legally viable alternative as it would violate portions of the CCAA.

Under Alternative 2, the BAAQMD would implement a Transit Access and Low Emission Vehicle Emphasis Alternative. Significant impacts were identified for some TCMs in the proposed project related to access to transit stations, including ferry and railroad stations. The potential localized air quality impacts identified in the DEIR could result from CO emissions during congested rush hours and diesel exhaust from idling buses and diesel engines accessing the transit facilities. While localized CO impacts are unlikely due to statewide use of oxygenated fuels and declining trends in background CO concentrations, the level of analysis provided in this Program DEIR prevented the District from concluding the impact would be less than significant. Transportation impacts would occur from congestion during rush hours in the vicinity of the transit facilities. All of these impacts could be compounded by TCM 15 – Local Land Use Planning and Development Strategies, that would encourage higher densities around transit facilities resulting in increased generation and exposure to air pollutants and increased traffic congestion.

Some aspects of the TCMs in the 2005 Ozone Strategy in part mitigate the localized air quality and traffic impacts, including TCM 3 – Improve Local and Areawide Bus Service, which would reduce exposure to diesel exhaust by replacing diesel buses with clean fuel buses and retrofit of existing buses with emission control devices. TCM 5 – Improve Access to Rail and Ferries would improve access to rail and ferries by expanding feeder buses and shuttles and improving bicycle and pedestrian access. TCM 9 – Improve Bicycle Access and Facilities would increase bicycle access to transit. TCM 15 – Local Land Use Planning and Development Strategies includes parking strategies that would reduce this impact, such as reduced parking, shared parking and parking pricing. TCM 19 - Improve Pedestrian Access and Facilities, would increase pedestrian access to transit facilities. Measure MS 1- Diesel Equipment Idling Ordinance, would reduce bus emissions by limiting bus idling times. MS 3 – Low Emission Vehicle Incentives would reduce diesel exhaust and other mobile source emissions by increasing the number of low emission buses, as well as other light and heavy-duty vehicles. Alternative 2 would place greater emphasis on implementing these TCMs.

Under Alternative 2, Transit Access and Low Emission Vehicle Emphasis Alternative, the potential significant air quality and transportation and traffic impacts associated with the proposed project could be reduced. The level to which these TCMs could be effective in reducing air emissions and transportation and traffic impacts is unknown at this time. Therefore, the air quality and transportation and traffic impacts remain essentially the same as the proposed project.

1.2.4 EXECUTIVE SUMMARY – CHAPTER 5: OTHER CEQA TOPICS

1.2.4.1 Relationship Between Short-term Uses and Long-Term Productivity

Implementing the 2005 Ozone Strategy is not expected to achieve short-term goals at the expense of long-term environmental productivity or goal achievement. The purpose of the 2005 Ozone Strategy is to set forth a comprehensive control program to demonstrate

that the Bay Area will make progress towards attaining the State one-hour ozone standard. By attaining the State ambient air quality standard, the Ozone Strategy is expected to enhance short and long-term environmental productivity in the region.

Of the potential environmental impacts discussed in Chapter 3, only those related to aesthetics, air quality, biological resources, cultural resources, transportation and traffic, and utilities and service systems are considered potentially significant after mitigation.

1.2.4.2 Significant Irreversible Environmental Changes

Implementation of the 2005 Ozone Strategy is not expected to result in significant irreversible adverse environmental change. The Ozone Strategy would place only a minor incremental demand on nonrenewable and limited resources, such as energy and water supplies, relative to the accelerated rate of use of these resources due to population growth and increased consumer demand. Some of the transportation control measures (e.g., TCM 7 – Improve Ferries) in the Ozone Strategy could result in significant impacts to aesthetics, localized air quality, biological resources, cultural resources, transportation and traffic and utilities and service systems. Mitigation measures have been identified to minimize some of these potentially significant impacts. The largely irretrievable conversion of undeveloped/agricultural land to urban uses is a function of the growing population and local land use authority, not the 2005 Ozone Strategy. The 2005 Ozone Strategy is expected to result in long-term benefits associated with improved air quality.

1.2.4.3 Growth-Inducing Impacts

Growth-inducing impacts can generally be characterized in three ways: (1) a project includes sufficient urban infrastructure to result in development pressure being placed on less developed adjacent areas; (2) a large project affects the surrounding community by producing a "multiplier effect," which results in additional community growth; and (3) a new type of development is allowed in an area, which subsequently establishes a precedent for additional development of a similar character. None of the above scenarios characterize the project evaluated in the EIR.

TABLE 1-2
2005 Ozone Strategy Control Measure Analysis

Control Meas. No.	Control Measure Description	Pollutant	Control Measure	Potential Impact
SS 1	Auto Refinishing	VOC	Reformulated low-VOC coatings/solvents	**Less than significant impacts:** air quality; hazards/hazardous materials; hydrology/water quality; and utilities/service systems.
SS 2	Graphic Arts Operations	VOC	Reformulated low-VOC coatings/solvents	**Less than significant impacts:** air quality; hazards/hazardous materials; hydrology/water quality; and utilities/service systems.
SS 3	High Emitting Spray Booths	VOC	Reformulated low-VOC coatings/solvents, add on control equipment	**Less than significant impacts:** air quality; hazards/hazardous materials; hydrology/water quality; and utilities/service systems.
SS 4	Polyester Resin Operations	VOC	Reformulated low-VOC coatings/solvents	**Less than significant impacts:** air quality; hazards/hazardous materials; hydrology/water quality; and utilities/service systems.
SS 5	Wood Products Coating	VOC	Reformulated low-VOC coatings/solvents	**Less than significant impacts:** air quality; hazards/hazardous materials; hydrology/water quality; and utilities/service systems.
SS 6	Flares	VOC	Most likely through control of operations but could include incineration	**Less than significant impacts:** air quality.
SS 7	Gasoline Bulk Terminals and Plant	VOC	More stringent standards, emission controls (e.g. flares)	**Less than significant impacts:** air quality.
SS 8	Marine Loading Operations	VOC	Add-on control equipment	**Less than significant impacts:** air quality; and utilities/service systems.
SS 9	Organic Liquid Storage Tanks	VOC	Add domes to tanks, improved standards for tank cleaning, I&M programs	**Less than significant impacts:** aesthetics; and air quality.
SS 10	Pressure Relief Devices	VOC	Add-on control equipment	**Less than significant impacts:** air quality; and utilities/service systems.

TABLE 1-2 (cont.)
2005 Ozone Strategy Control Measure Analysis

Control Meas. No.	Control Measure Description	Pollutant	Control Measure	Potential Impact(s)
SS 11	Wastewater Systems	VOC	Installation of vapor recovery devices, seals/traps on drains, installation of solid piping, installation of water seals	**Less than significant impacts:** hydrology/water quality.
SS 12	Industrial, Institutional and Commercial Boilers	NOx	Low NOx Burners	**Less than significant impacts:** air quality; hazards/hazardous materials; and utilities/service systems.
SS 13	Large Water Heaters & Small Boilers	NOx	Low NOx burners, lower standards for new heaters/boilers	**Less than significant impacts:** air quality; hazards/hazardous materials; and utilities/service systems.
SS 14	Stationary Gas Turbines	NOx	Add-on control equipment	**Significant impact:** hazards/hazardous materials. **Less than significant impacts:** air quality; hazards/hazardous materials; and utilities/service systems.
SS 15	Promote Energy Conservation	NOx VOC	Add-on control equipment	**None:** 1.
MS 1	Diesel Equipment Idling Ordinance	NOx VOC	Encourage local government to adopt idling ordinance	**None:** 1; 2.
MS 2	Green Contracting	NOx VOC	Encourage local government to voluntary adoption of green contracting	**None:** 1.
MS 3	Low-Emission Vehicle Incentives	NOx VOC	Purchase low or zero-emission vehicles or engines, engine repowers, retrofits and replacements; add-on control equipment; clean fuels or additives; and use of alternative fuels	**Less than significant impacts:** air quality; hazards/hazardous materials; and utilities/service systems.

TABLE 1-2 (cont.)
2005 Ozone Strategy Control Measure Analysis

Control Meas. No.	Control Measure Description	Pollutant	Control Measure	Potential Impact(s)
MS 4	Vehicle Buy Back Program	NOx	Provide financial incentives to scrap vehicles	**Less than significant impacts:** utilities/service systems.
TCM 1	Voluntary Employer-Based Trip Reduction Programs	NOx VOC	Support and encourage employers to promote the use of commute alternative programs	**Significant impacts after mitigation:** air quality; and transportation/traffic.
TCM 3	Improve Local and Areawide Bus Service	NOx VOC	Add on control devices (particulate traps and NOx catalysts), alternative clean fuels	**Significant impacts after mitigation:** air quality; and transportation/traffic. **Less than significant impacts:** utilities/service systems.
TCM 4	Upgrade and Expand Local and Regional Rail Service	NOx VOC	Construction of additional rail facilities, electrification of rail services	**Significant impacts after mitigation:** aesthetics; air quality; cultural resources; and transportation/traffic. **Less than significant impacts following mitigation:** hydrology/water quality; and noise. **Less than significant impacts:** aesthetics; air quality; hydrology/water quality; noise; and utilities/service systems.
TCM 5	Improve Access to Rail and Ferries	NOx VOC	Construction of new facilities, use of low emission vehicles	**Significant impacts after mitigation:** air quality. **Less than significant impacts following mitigation:** hydrology/water quality; and noise. **Less than significant impacts:** hydrology/water quality; noise; transportation/traffic; and utilities/service systems.
TCM 6	Improve Interregional Rail Service	NOx VOC	Construction of new rail facilities	**Significant impacts after mitigation:** aesthetics; air quality; cultural resources; and transportation/traffic. **Less than significant impacts following mitigation:** noise. **Less than significant impacts:** noise.

TABLE 1-2 (cont.)
2005 Ozone Strategy Control Measure Analysis

Control Meas. No.	Control Measure Description	Pollutant	Control Measure	Potential Impact(s)
TCM 7	Improve Ferry Service	NOx VOC	Construction of new facilities, use of low emission ferries, and add-on controls	**Significant impacts after mitigation:** aesthetics; air quality; biological resources; cultural resources; transportation/traffic; and utilities/service systems. **Less than significant impacts following mitigation:** hydrology/water quality; and noise. **Less than significant impacts:** hazards/hazardous materials; hydrology/water quality; land use/planning; noise; and utilities and service.
TCM 8	Construct Carpool/Express Bus Lanes on Freeways	NOx VOC	Construction of new HOV lanes	**Significant impacts after mitigation:** aesthetics; and cultural resources. **Less than significant impacts following mitigation:** noise. **Less than significant impacts:** air quality; and noise.
TCM 9	Improve Bicycle Access and Facilities	NOx VOC	Construction of additional bicycle lanes	**Less than significant impacts:** air quality; and transportation/traffic.
TCM 10	Youth Transportation	NOx VOC	Promote safe routes to school & carpooling programs, support transit ride discounts programs; convert school buses to clean fuels/install particulate matter retrofit devices	**None:** 1.

TABLE 1-2 (cont.)
2005 Ozone Strategy Control Measure Analysis

Control Meas. No.	Control Measure Description	Pollutant	Control Measure	Potential Impact(s)
TCM 11	Install Freeway Traffic Management Systems	NOx VOC	Integrate traffic management features into new freeway construction; maintain and expand level of freeway service patrol and 511 traffic information service; extend ramp metering; require traffic management elements in Caltrans projects	**Significant impacts after mitigation:** air quality; and transportation/traffic.
TCM 12	Arterial Management Measures	NOx VOC	Coordinate traffic controls on major arterial routes; provide priority bus treatment along major bus routes	**None:** 1.
TCM 13	Transit Use Incentives	NOx VOC	Promote various transit use programs	**Significant impacts after mitigation:** air quality; and transportation/traffic.
TCM 14	Carpool and Vanpool Services and Incentives	NOx VOC	Promote carpooling and vanpooling	**None:** 1.
TCM 15	Local and Land Use Planning and Development Strategies	NOx VOC	Includes various indirect source mitigation measures	**Significant impacts after mitigation:** air quality; and transportation/traffic. **Less than significant impacts:** land use/planning.
TCM 16	Public Education/Intermittent Control Measures		Maintain and expand outreach programs in educating public about health effects of air pollution	**None:** 1.

TABLE 1-2 (cont.)

2005 Ozone Strategy Control Measure Analysis

Control Meas. No.	Control Measure Description	Pollutant	Control Measure	Potential Impact(s)
TCM 17	Conduct Demonstration Projects		Promote demonstration projects that can serve as models for trip/ travel demand reductions and promote the use of low or zero emission vehicles	**None:** 4.
TCM 18	Implement Transportation Pricing Reform	NOx VOC	Implement pricing reform measures that would better link the cost of providing transportation facilities and services with the cost of using them	**None:** 3.
TCM 19	Improve Pedestrian Access and Facilities	NOx VOC	Promote pedestrian travel by making sidewalks and pathways safe and convenient for travel	**None:** 1; 2.
TCM 20	Promote Traffic Calming Measures		Includes various measures to increase pedestrian traffic and decrease the use of mobile sources	**Less than significant impacts:** transportation/traffic.

1. Control technologies do not generate adverse impacts.
2. Changes in operating practices with no impact identified.
3. Control measure is aimed at increasing fees with no specific impact identified.
4. Environmental impacts determined to be speculative.

CHAPTER 2

PROJECT DESCRIPTION

2.0 PROJECT DESCRIPTION

2.1 INTRODUCTION

Ozone is the principal component of photochemical "smog". Ozone is highly reactive, and at high concentrations near ground level, can be harmful to public health.[1] The Bay Area 2005 Ozone Strategy is a strategy to continue to reduce emissions of the pollutants that form ground-level ozone, and to assure that the region attains and maintains compliance with State ozone standards.

Ozone is not emitted directly from pollution sources. Instead, ozone is formed in the atmosphere through complex chemical reactions between hydrocarbons (also known as "reactive organic gases" or "volatile organic compounds"), and nitrogen oxides, in the presence of sunlight. Ozone levels are usually highest on hot, windless summer afternoons, especially in inland valleys.

Ozone can damage the tissues of the lungs and respiratory tract. High concentrations of ozone irritate the nose, throat and respiratory system and constrict the airways. Ozone also can aggravate other respiratory conditions such as asthma, bronchitis and emphysema. Repeated exposure to high ozone levels can make people more susceptible to respiratory infection and lung inflammation, and permanently damage lung tissue. Children are most at risk, as they are active outdoors in the summer, when ozone levels are highest. Seniors and people with respiratory illnesses are also especially sensitive to ozone's effects. Even healthy adults, working or exercising outdoors during high ozone levels, can be affected. Ozone also damages trees, agricultural crops and other plants.

The State and national governments have established ambient air quality standards (AAQS) for ground level ozone (and other air pollutants) that are intended to protect human health from ozone's adverse effects. Air quality standards define the maximum amount of a pollutant that can be present in outdoor air without harm to public health. The standards are generally set at levels low enough to protect even the most sensitive individuals in our communities. National ambient air quality standards are set by the U.S. Environmental Protection Agency (U.S. EPA), while State standards are set by the California Air Resources Board (CARB).

The Bay Area Air Quality Management District (BAAQMD or Air District) operates a network of air quality monitoring stations throughout the region to constantly monitor air quality conditions. Data from the air monitoring stations allows the Air District to determine whether the region meets State and national ambient air quality standards and to track progress in improving air quality.

The one-hour national ambient air quality standard for ozone is 0.12 parts per million (ppm). The California one-hour ozone standard is more stringent than the national

[1]While ground level ozone is a harmful air pollutant, ozone in the upper atmosphere is beneficial because it blocks the sun's harmful ultraviolet rays. The 2005 Ozone Strategy focuses on reducing *ground level* ozone only.

standard, and is set at 0.09 ppm. An exceedance of the national or State standard occurs if and when ozone concentrations at any Air District monitoring station equal or exceed the national or State standard, respectively, over a one-hour period. In 2004, the national one-hour ozone standard was not exceeded, while the State standard was exceeded on seven days.

In July 1997, EPA established a new national ozone standard. The new 8-hour standard became effective in June 2004. Defined as "concentration-based," the new national ozone standard is set at 85 parts per billion averaged over eight hours. The determination of whether a region attains the standard is based on the 3-year average of the annual 4th highest daily maximum 8-hour ozone concentration. The new national 8-hour standard is considered to be more health protective because it protects against health effects that occur with longer exposure to lower ozone concentrations.

In April 2004, EPA designated regions as attainment and nonattainment areas for the 8-hour standard. These designations took effect on June 15, 2004. EPA formally designated the Bay Area as a nonattainment area for the national 8-hour ozone standard, and classified the region as "marginal" according to five classes of nonattainment areas for ozone, which range from marginal to extreme. Specific planning requirements for 8-hour marginal nonattainment areas are not yet fully established, as EPA has not issued Phase 2 guidance of the 8-hour implementation rule and certain elements of the Phase 1 guidance are subject to legal challenge. As 8-hour planning requirements become clear, the Bay Area will address the requirements in subsequent documents.

Purpose and Organization of the 2005 Ozone Strategy

The most recent plan for the State ozone standard was the 2000 Clean Air Plan (or "2000 CAP"). With the 2005 Ozone Strategy, the Air District is addressing the planning requirements for the State one-hour ozone standard.

Section 1 of the 2005 Ozone Strategy provides an introduction and general overview of the document. Section 2 addresses State one-hour ozone planning requirements and consists of the region's triennial update to our strategy to achieve the California one-hour ozone standard. Section 3 discusses various ozone-related air quality issues of concern to the Air District and the public. It also describes the environmental review process as well as the District's efforts to encourage and facilitate public involvement in the development of the ozone strategy. Appendices provide detail on the public involvement process, control measure review and evaluation process, control measure descriptions, further study measures, and other technical support information.

State Planning Requirements

The California Clean Air Act requires regions that do not meet the State one-hour ozone standard to prepare plans for attaining the standard, and to update these plans every three years. In summary, these plans must include estimates of current and future emissions of

the pollutants that form ozone, and a control strategy, including "all feasible measures", to reduce these emissions. The plans must also propose measures to reduce transport of air pollutants to downwind regions.

The first Bay Area plan for the State one-hour ozone standard was the 1991 Clean Air Plan. Subsequently, the Clean Air Plan was updated and revised in 1994, 1997, and 2000. Each of these triennial updates proposed additional measures to reduce emissions from a wide range of sources, including industrial and commercial facilities, motor vehicles, and "area sources". The 2005 Ozone Strategy includes the latest triennial update to the Bay Area strategy to achieve the State one-hour ozone standard.

The 2005 Ozone Strategy has been prepared by the Air District, in consultation with the Metropolitan Transportation Commission (MTC) and the Association of Bay Area Governments (ABAG). The Air District Board of Directors will consider adoption of the 2005 Ozone Strategy and, upon adoption, will transmit it to CARB for their review and approval.

2.2 PROJECT LOCATION

The BAAQMD has jurisdiction of an area encompassing 5,600 square miles. The Air District includes all of Alameda, Contra Costa, Marin, San Francisco, San Mateo, Santa Clara, and Napa Counties, and portions of southwestern Solano and southern Sonoma counties. The San Francisco Bay Area is characterized by a large, shallow basin surrounded by coastal mountain ranges tapering into sheltered inland valleys. The combined climatic and topographic factors result in increased potential for the accumulation of air pollutants in the inland valleys and reduced potential for buildup of air pollutants along the coast. The Basin is bounded by the Pacific Ocean to the west and includes complex terrain consisting of coastal mountain ranges, inland valleys and bays (see Figure 2-1).

2.3 PROPOSED CONTROL STRATEGY

This section presents the proposed control measures that address State one-hour ozone planning requirements to achieve the California one-hour ozone standard. The measures constitute a roadmap for how the Bay Area proposes to comply with the State one-hour air quality standard for ozone as expeditiously as practicable and how the region will reduce transport of ozone and ozone precursors to neighboring air basins. The control strategy includes stationary source measures, mobile sources measures and transportation control measures.

The control strategy for the 2005 Ozone Strategy is to implement all feasible measures on an expeditious schedule in order to reduce emissions of ozone precursors. This is consistent with California Clean Air Act requirements in the Health and Safety Code and pollutant transport mitigation requirements in the California Code of Regulations.

2.3.1 CONTROL MEASURE DEVELOPMENT

To satisfy California's "all feasible measures" requirements, the Air District investigated a wide range of potential control measures from many sources. The Air District sought ideas for new sources to control, as well as ways to strengthen existing rules and programs. To identify potential control measures, the Air District:

- Participated in discussions as part of the Rule Development Managers subcommittee of the CAPCOA Engineering Managers Committee to develop a statewide "all feasible measures" list.
- Participated with staff from CARB, Yolo-Solano APCD, Sacramento Metropolitan AQMD, and San Joaquin Valley Unified APCD on a rule comparison project.
- Reviewed suggestions developed by consultants for Sacramento Metropolitan AQMD.
- Investigated rules in other districts throughout California.
- Investigated control measures and programs from plans in other districts and agencies, both within and outside the state.
- Considered comments and suggestions from the Ozone Working Group (a technical working group of stakeholders in the ozone planning process).
- Considered comments and suggestions from community meetings.
- Considered comments and suggestions from Air District Board members, Advisory Council members and staff.

In total, Air District staff considered 390 control measure suggestions, not including transportation control measures. In evaluating a control measure, staff considered a variety of factors, including:

- Technological feasibility of proposed controls;
- Emission inventory of the source category and total likely emission reductions from proposed controls;
- Cost-effectiveness in dollars per ton of emissions reduced;
- Enforceability, including whether emission reductions are real, quantifiable, permanent, enforceable, and surplus;
- Rate (and timing) of emissions reductions;
- Public acceptability, including interests and concerns of community members;
- Pollutant reduced (volatile organic compounds, nitrogen oxides or both);
- Any potential adverse environmental impacts; and
- Socioeconomic impacts.

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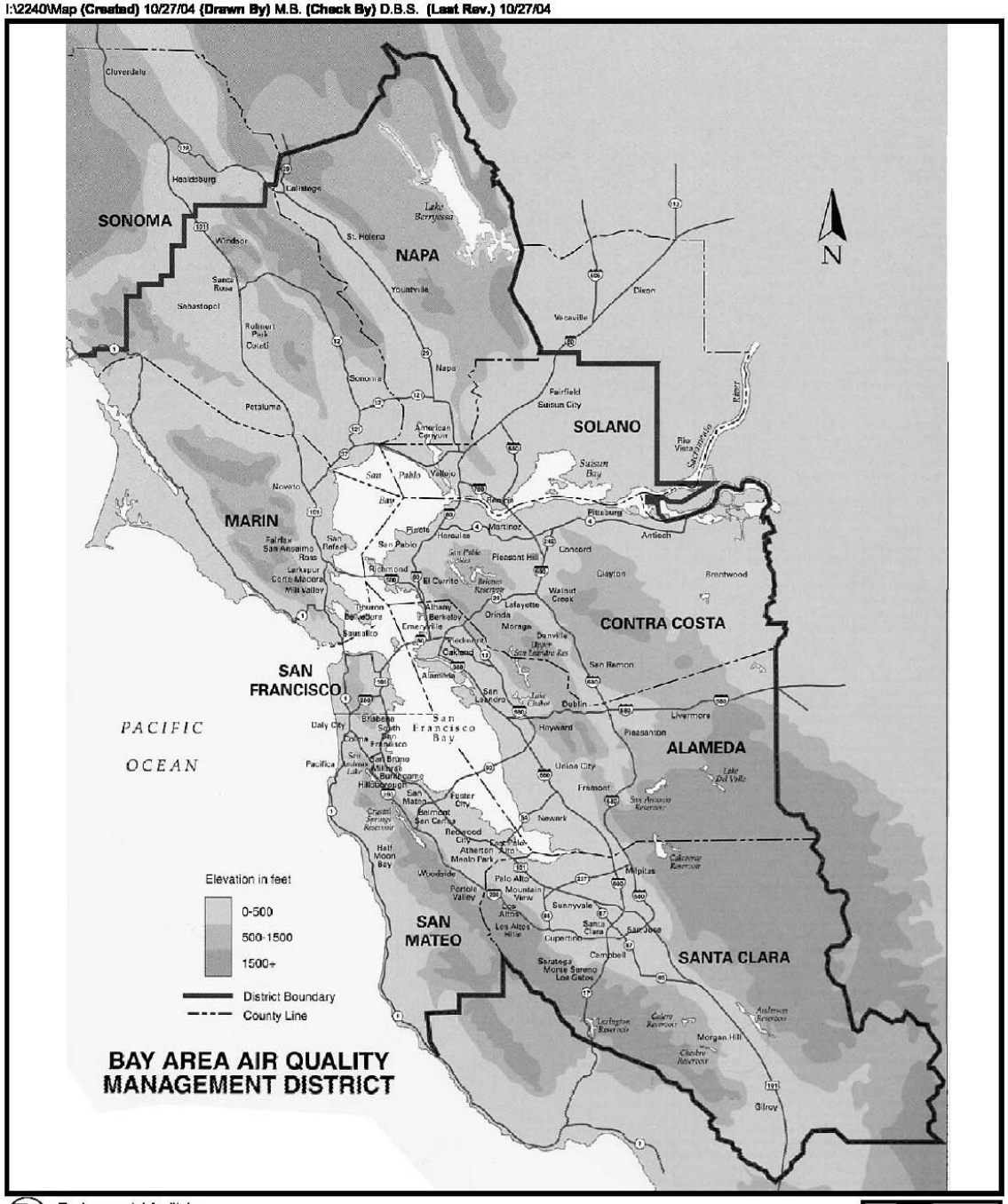

Environmental Audit, Inc.

NOT TO SCALE

LOCATION OF BAY AREA AIR QUALITY MANAGEMENT DISTRICT

Figure 2-1

2.3.2 ADDRESSING TRANSPORT REQUIREMENTS

The CCAA requires CARB to periodically assess transport of ozone and ozone precursors from upwind to downwind regions, and to establish mitigation requirements for upwind districts (Sec. 39610). The CCAA also requires air districts to address transport mitigation requirements in the triennial updates to strategies to achieve the State ozone standard (Sec. 40912). To summarize the transport mitigation requirements, the Air District must:

1. Adopt and implement all feasible measures;
2. Adopt and implement Best Available Retrofit Control Technology (BARCT);
3. Adopt a no net increase permitting program for sources above 10 tons per year;
4. Include measures to attain the standard in specified downwind regions.

The 2005 Ozone Strategy addresses all of the above. The requirements to adopt all feasible measures, and implement BARCT on all existing stationary sources are necessary for the Bay Area to meet both attainment planning and transport mitigation requirements. These requirements are addressed in the control strategy as well as through Air District rule development and permitting processes. With respect to the no net increase requirement, the Air District adopted a 10 ton/year no net increase requirement for ozone precursors in District Regulation 2, Rule 2: New Source Review on December 21, 2004. Regarding measures sufficient to attain the State ozone standard in specified transport areas, this is accomplished through the proposal to adopt all feasible measures as identified in the control strategy. As adoption of all feasible measures represents the most stringent control strategy that can be accomplished, this requirement is met with the approval of each triennial plan.

2.3.3 STATIONARY SOURCE MEASURES

Table 2-1 outlines the 15 stationary and area source measures proposed for the Draft 2005 Ozone Strategy.

TABLE 2-1
Proposed Stationary and Area Source Control Measures

CM #	BAAQMD Reg - Rule	Source Category	Description	Estimated VOC Reduction tons/day	Estimated NOx Reduction tons/day
Industrial – Commercial Processes					
SS-1	8-45	Auto Refinishing	Reduce VOC limits for some coating categories	0.7	
SS-2	8-20	Graphic Arts Operations	Reduce VOC limits for flexo-graphic ink and clean up solvent	0.15	
SS-3		High Emitting Spray Booths	Require additional controls on spray booths that emit > 20 tons VOC /yr	0.5	
SS-4	8-50	Polyester Resin Operations	Reduce allowable monomer content for some types of polyester resins	0.3	
SS-5	8-32	Wood Products Coating	Reduce VOC limits for some coating categories	0.68	
Petroleum Products Production and Distribution					
SS-6	12-12	Flares	Minimize flaring (ADOPTED 7/20/05)	TBD*	TBD*
SS-7	8-33, 39	Gasoline Bulk Terminals and Plants	Require automatic shutoff and back-pressure monitors, set more stringent leak, emission standards	0.14	
SS-8	8-44, 46	Marine Loading Operations	Control additional cargoes, set more stringent leak standards and or control housekeeping emissions	0.7 - 1.0	
SS-9	8-5	Organic Liquid Storage Tanks	Tighten existing requirements and/or control lower vapor pressure liquids	TBD*	
SS-10	8-28	Pressure Relief Devices	Improve enforceability of rule	0.001	
SS-11	8-8	Wastewater Systems	Control emissions from wastewater collection systems (ADOPTED 9/15/04)	2.1	

TABLE 2-1 (continued)
Proposed Stationary Source Control Measures

CM #	BAAQMD Reg - Rule	Source Category	Description	Estimated VOC Reduction tons/day	Estimated NOx Reduction tons/day
Combustion Processes					
SS-12	9-7	Industrial, Institutional and Commercial Boilers	Extend existing limits to smaller boilers and/or set a more stringent standard		0.5 - 1.0
SS-13	9-6, 7	Large Water Heaters and Small Boilers	Require new, small boilers and large water heaters to meet NOx limits		0.39
SS-14	9-9	Stationary Gas Turbines	Implement BARCT NOx limits on existing turbines		1.2
Education Programs					
SS-15		Promote Energy Conservation	Educate government, industry and the public in energy efficient choices	unknown	unknown

*TBD – emissions reductions to be determined

A brief description of each stationary source control measure is provided below. Refer to Appendix C of the Bay Area 2005 Ozone Strategy for full descriptions and evaluations of each individual stationary and mobile source control measure.

SS-1 AUTO REFINISHING: This control measure seeks to reduce VOC emissions from automobile refinishing facilities through the implementation of a lower VOC limit for topcoats. This control measure also considers the elimination of two coating categories (multi-stage topcoats and specialty coatings) as well as a reduction in the emissions from solvent used during surface preparation and clean up.

SS-2 GRAPHIC ARTS OPERATIONS: This control measure seeks to reduce VOC emissions from printing operations by reducing the allowable VOC limit for flexographic ink used on porous substrates, and by limiting the VOC content of clean up solvent used on flexographic presses. This control measure proposes a 25 grams per liter (g/l) VOC limit for flexographic clean up solvent and 225 g/l VOC limit for flexographic ink.

SS-3 HIGH EMITTING SPRAY BOOTHS: This control measure seeks to reduce VOC emissions from coating operations that emit in excess of 20 tons of emissions per year by setting percentage reductions or by requiring abatement technology. This control measure is directed at various source categories at the highest emitting spray booth facilities. Several air pollution control devices are commonly available to reduce VOC

emissions from spray booths including carbon or zeolite adsorption; thermal or catalytic oxidation; and newer technologies such as biofiltration, cryogenic condensation, ultraviolet oxidation, and hybrid concentrator/oxidation systems.

SS-4 POLYESTER RESIN OPERATIONS: This control measure seeks to reduce VOC emissions from polyester resin operations (fiberglass product manufacturing) by lowering some limits in existing Air District Regulation 8, Rule 50: Polyester Resin Operations. This control measure could revise the allowable monomer content to an amount lower than the current 35 percent for standard polyester resin materials and 50 percent for materials used for corrosion-resistant or fire-retardant service.

SS-5 WOOD PRODUCTS COATING: This control measure seeks to reduce VOC emissions from wood coating facilities by lowering some VOC limits in existing Air District Regulation 8, Rule 32: Wood Products Coating. This control measure proposes lower VOC limits on the following types of wood products coatings: high solids stain (350 g/l), sealers (275 g/l), filler (275 g/l), low solids stains (120 g/l) and wash coats (120 g/l).

SS-6 FLARES (REGULATION 12, RULE 12 ADOPTED 7/20/2005): This control measure will reduce VOC emissions from flares at petroleum refineries and chemical plants. Flares in refineries provide for the safe disposal of liquid and gaseous hydrocarbons that are either automatically vented from process units through pressure safety valves, control valves or manually drawn from units. The new regulation uses an approach that requires each refinery to develop a comprehensive plan to minimize flare use. Significant differences in refinery configurations and capacities to process and use gas in other processes require the rule to provide flexibility to implement the most appropriate flaring prevention measures for each refinery. The minimization plans will be developed in active consultation with Air District staff and will require annual updates to ensure that new technologies and practices will be identified and implemented in a process of continuous improvement.

SS-7 GASOLINE BULK TERMINALS AND BULK PLANTS: This control measure seeks to reduce VOC emissions from gasoline bulk terminals and bulk plants through the following control methods: requiring backpressure monitors and controls to shut down loading when backpressure exceeds a set standard, setting more stringent liquid and vapor leak standards, increasing enforceability, and setting a more stringent emission standard.

SS-8 MARINE LOADING OPERATIONS: This control measure seeks to further reduce VOC emissions from marine loading operations by controlling currently unregulated cargoes. The current Air District regulation only applies to five types of petroleum products. This proposed control measure would apply to any loading or housekeeping activity on ships or barges that would emit organic compounds above a set emission limit. This measure would also consider controlling housekeeping operations such as tank washing, tank venting or gas freeing aboard marine vessels. This control measure has three potential methods for control: 1) a requirement that cargoes be

controlled based on emissions rather than type of cargo and the development of methodology to easily determine applicability of the standards to any given load; 2) a reduction in the fugitive emission standards to 1000 parts per million (ppm); and 3) a requirement to control emissions from ballasting into non-segregated tanks where a regulated cargo was previously stored.

SS-9 ORGANIC LIQUID STORAGE TANKS: This control measure seeks to reduce VOC emissions from organic liquid storage tanks typically found at petroleum refineries, chemical plants, gasoline bulk plants and terminals by supplementing existing requirements in Air District Regulation 8, Rule 5: Storage of Organic Liquids. This control measure has three potential methods for control: 1) a requirement for domes to reduce wind speed over floating roof tanks that store liquids with at least 3.0 pounds per square inch in absolute (psia) vapor pressure; 2) improved standards for degassing and cleaning tanks and for storing and transporting removed sludges; and 3) implementing an inspection and maintenance program that provides an incentive for more frequent tank inspections.

SS-10 PRESSURE RELIEF DEVICES AND BLOWDOWN SYSTEMS: This control measure seeks to reduce VOC emissions from pressure relief devices (PRDs) in petroleum refineries and chemical plants. This control measure has the following potential methods for control: 1) to require facilities to demonstrate the ability to detect and quantify Release Events (10 pounds of pollutants), 2) to require data recording and recordkeeping requirements for venting and emissions verification, 3) to add a definition for a term in lieu of "source" to ensure the rule applies to individual process components and related PRDs, and 4) to require "tell-tale indicators" or the equivalent for all atmospheric PRDs, and add a definition of "tell-tale indicator."

SS-11 WASTEWATER SYSTEMS: This control measure seeks to reduce VOC emissions from refinery wastewater systems by requiring control, covers or water traps at various emission points such as open drains, sumps, junction boxes and manholes. The District regulates VOC emissions from wastewater systems by setting equipment standards which require minimum gaps in seals around oil-water separators, gauging and sampling wells, dissolved air flotation units, slop oil vessels, separator effluent channels and junction boxes. A variety of methods can provide controls for open process drains, junction boxes and manholes, such as installation of vapor recovery on emission points accompanied by a control device, seals or traps on drains and open points in junction boxes and manhole covers, and the installation of solid piping where openings to the atmosphere exist.

SS-12 INDUSTRIAL, INSTITUTIONAL AND COMMERCIAL BOILERS: This control measure seeks to reduce NOx emissions from boilers by extending controls to boilers smaller than those currently regulated by Air District Regulation 9, Rule 7. This measure could extend the current NOx limit of 30 ppm to smaller boilers in the 5-10 million BTU/hr range as well as the 2-5 million BTU/hr range. This control measure also includes considering lower NOx limits than those in existing Air District Regulation 9, Rule 7. Control would generally be achieved by the installation of low-NOx burners, many of which may be installed through the retrofit of existing models.

SS-13 LARGE WATER HEATERS AND SMALL BOILERS: This control measure seeks to reduce NOx emissions from water heaters larger than those currently regulated by existing Air District regulations, and from boilers smaller than those currently regulated by existing Air District regulations. This control measure proposes a NOx limit of 40 nanograms per joule of heat output for large water heaters with a capacity greater than 75,000 BTU/hr and less than or equal to 400,000 BTU/hr. This control measure also proposes a NOx limit of 30 ppm for boilers larger than 400,000 BTU/hr and less than or equal to two million BTU/hr.

SS-14 STATIONARY GAS TURBINES: This control measure seeks to reduce NOx emissions from stationary gas turbines through the revision of existing limits to reflect current BARCT. Most emission reductions would come from the installation of selective catalytic reduction (SCR) on large turbines (>10 MW) that do not currently use SCR to control NOx emissions. Some additional emission reductions could come from the installation of dry low-NOx combustors (DLN) on small turbines (<10 MW). This control measure proposes NOx limits of 35 ppm limit if DLN is not available, and 25 ppm if DLN is available.

SS-15 PROMOTE ENERGY CONSERVATION: This measure would seek to educate public and private entities about the link between air quality, greenhouse gas emissions and energy conservation. This control measure would reduce emissions of criteria pollutants and greenhouse gas emissions through the voluntary adoption, implementation and enforcement of a model ordinance by local government agencies to reduce energy consumption. This measure could also develop new Air District programs or strengthen existing Air District programs including education campaigns targeting the general public, businesses and industry through outreach programs and workshops.

2.3.4 BAY AREA RULE DEVELOPMENT PROCESS

Most stationary source measures in the Ozone Strategy are implemented through the rule development process. The Bay Area Air District goes through a detailed process to adopt rules and regulations to impose standards on, and limit emissions from, Bay Area industry.

Subsequent to rule adoption by the Board, BAAQMD staff work to prepare inspection protocols, policies and procedures to interpret the rule as necessary, and to prepare compliance advisories to notify affected parties of the rule and compliance dates. Staff also forward the rule to CARB.

Each December, the Air District Board of Directors approves an annual regulatory schedule and notifies CARB of its expected rule development schedule for the following calendar year, as required by the CCAA. Table 2-2 shows the proposed scheduled for regulation adoption during 2005, 2006 and 2007.

TABLE 2-2
Regulatory Agenda, 2005 – 2007

2005 Regulatory Agenda

CM #	Control Measure (Reg and Rule)	ER Potential
SS 6	Flares (Reg 12-12) (ADOPTED 7/20/05)	TBD
SS 8	Marine Loading Operations (Reg 8-44, 46)	0.7 – 1.0 tpd
SS 10	Pressure Relief Devices (Reg 8-28)	0.001

2006 Regulatory Agenda

CM #	Control Measure (Reg and Rule)	ER Potential
SS 2	Graphic Arts Operations (Reg 8-20)	0.15 tpd
SS 7	Gasoline Bulk Terminals and Bulk Plants (Reg 8-33, 39)	0.14 tpd
SS 9	Organic Liquid Storage (Reg 8-5)	TBD
SS 13	Large Water Heaters and Small Boilers (Reg 9-6, 7)	0.39 tpd NOx
SS 14	Stationary Gas Turbines (Reg 9-9)	1.2 tpd NOx
SS 15	Energy Conservation	unknown

2007 Regulatory Agenda

CM #	Control Measure (Reg and Rule)	ER Potential
SS 1	Auto Refinish Operations (Reg 8-45)	0.7 tpd
SS 3	High Emitting Spray Booths	0.5 tpd
SS 4	Polyester Resin Operations (Reg 8-50)	0.3 tpd
SS 5	Wood Products Coating (Reg 8-32)	0.68 tpd
SS 12	Industrial, Institutional and Commercial Boilers (Reg 9-7)	0.5 - 1.0 tpd NOx

* Emission Reduction, stated for VOC/ROG unless otherwise noted.

2.3.5 MOBILE SOURCE PROGRAMS

The term "mobile source", as used in the CCAA and by the Air District, refers collectively to vehicular sources and other non-stationary sources. Mobile sources are defined in the CCAA as self-propelled devices that may travel upon a highway, including automobiles, trucks, construction equipment, farm equipment, and off-road vehicles. "Non-vehicular" mobile sources or "non-road" sources as they are defined in the federal Clean Air Act (CAA), include ships, boats, aircraft, locomotives, and lawn and garden equipment. Mobile sources are by far the largest sources of ozone precursors.

State and national programs play a critical role in reducing air pollutant emissions from mobile sources. Mobile source emissions are regulated by establishing equipment emission standards and by regulating the fuel used in the equipment. The federal CAA contains a special provision allowing California to set motor vehicle emission standards that are specific to the State. The California standards cover motor vehicles (including cars, motorcycles, and trucks), heavy industrial and construction equipment, off-highway vehicles such as dirt bikes and all-terrain vehicles, and lawn, garden and other utility engines. In California, these mobile sources are regulated primarily by CARB.

To ensure that motor vehicle emission control systems continue to operate properly they are regulated through in-use performance standards. The State of California has had an inspection and maintenance (I&M) program since 1984, and responsibility for the State's I&M program implementation rests with the California Bureau of Automotive Repair (BAR). In 2002, AB 2637 (Cardoza) was signed into law and required BAR to implement an Enhanced Area Smog Check Program in the urbanized regions of the San Francisco Bay Area. The program went into full effect in October 2003, and requires the use of a dynamometer to simulate the vehicle's emissions while in motion. In addition, the pass/fail cut points for emissions are more stringent for enhanced smog check areas and certain vehicles suspected of higher emissions are directed to Test-Only stations.

The Air District does not have the authority to regulate mobile sources but reduces mobile source emissions by providing grants or incentives to encourage the use of cleaner vehicles and fuels. The Transportation Fund for Clean Air (TFCA) is a grant program that funds both mobile source and transportation control measures implemented by local public agencies. To fund these measures the State Legislature allows the Air District to impose a $4 surcharge on motor vehicle registration fees paid for vehicles registered in the Bay Area. Mobile source measures funded through the TFCA program include purchase or lease of clean fuel vehicles, primarily through the Vehicle Incentive Program (VIP), as well as engine retrofits and repowers. Another TFCA program, the Vehicle Buy Back program, accelerates the retirement of older, high emitting vehicles from the region's roadways by providing incentives to scrap them.

The Carl Moyer Program provides incentives that cover the incremental cost of cleaner heavy-duty engines with a primary focus of reducing NOx emissions. Among the eligible projects are cleaner on-road, off-road, marine, locomotive and stationary agricultural pump engines, as well as forklifts, airport ground support equipment, and auxiliary power units. The Air District also has grant programs for low emission school buses and heavy-duty diesel PM10 filter retrofits.

In addition to State and federal regulations and Air District incentive programs, the Ozone Strategy includes control measures that reduce emissions from on-road and off-road mobile sources. These control measures encourage the retirement of older, more-polluting equipment and the introduction of new, less-polluting equipment, or encourage operational changes (e.g. reduced idling) to reduce emissions. The measures would be implemented mainly through incentive programs and through development and promotion of model ordinances for cities and counties. Table 2-3 contains a summary of the proposed mobile source control measures, including their proposed dates of adoption and estimates of the emission reductions they would achieve.

TABLE 2-3
Proposed Mobile Source Control Measures(1)

Measure	Source Category	Implementation Date	Estimated VOC Reduction (tpd)	Estimated NOx Reduction (tpd)
MS-1	Diesel Equipment Idling Ordinance	2006	0.13	1.96
MS-2	Green Contracting Ordinance	2006	NA	NA
MS-3	Low-Emission Vehicle Incentives	2005	0.03	0.6
MS-4	Vehicle Buy-Back Program	2005	0.48	0.31
Total			**0.64**	**2.87**

(1) While the focus of the Ozone Strategy is on reducing emissions of ozone precursors, many of the measures will also reduce emissions of fine particulate matter and this additional benefit is noted as well.

A brief description of each of the mobile source control measures is provided below. Refer to Appendix C of the Bay Area 2005 Ozone Strategy for full descriptions and evaluations of each individual stationary and mobile source control measure.

MS-1 DIESEL ENGINE IDLING ORDINANCE: This control measure seeks to reduce emissions from the idling of diesel equipment through the voluntary adoption and enforcement of a model ordinance by local government agencies. Reducing diesel equipment idling will primarily reduce emissions of NOx, particulate matter and toxic air contaminants. The measure would limit the amount of time operators of diesel equipment, including heavy-duty trucks, buses and construction equipment, idle their engines. This measure would reduce emissions from heavy-duty trucks at warehouse/distribution centers, port terminals, truck stops and rest areas.

MS-2 GREEN CONTRACTING ORDINANCE: This control measure seeks to develop and promote a model ordinance for local government agencies to use in amending local codes that govern public agency contracting. By adopting and implementing Green Contracting Ordinances, public agencies can play an important role in improving air quality by encouraging contractors to operate their businesses in ways that benefit air quality such as by operating low-emission vehicles, purchasing clean fuels, promoting ridesharing programs and curtailing polluting activities on Spare the Air days.

MS-3 LOW-EMISSION VEHICLE INCENTIVES: This control measure seeks to encourage the use of low-emission vehicles. Low-emission vehicles are those that have emissions which are significantly lower than the established vehicle standards of similar makes and model years and that typically have cleaner burning engines, fuels and/or exhaust treatment devices. This control measure is intended to increase the share of low-emission vehicles in the region's on-road and off-road fleet through Air District incentives like the Transportation Fund for Clean Air (TFCA), the Carl Moyer Program and other funding sources. Air District grant programs would be used to provide an incentive to purchase low or zero emission vehicles or engines, engine repowers, retrofits and replacements, exhaust treatments and add-on equipment, clean fuels or additives, and infrastructure to supply alternative fuels.

MS-4 VEHICLE BUY-BACK PROGRAM: This control measure seeks to accelerate the retirement of older, high emitting vehicles from the region's roadways by providing incentives to scrap them through the Air District's Vehicle Buy-Back Program. This control measure seeks to reduce emissions of VOC, NOx and PM from older model year light-duty motor vehicles. The Air District implements the Vehicle Buy-Back Program by contracting with vehicle dismantlers to screen, purchase, and destroy eligible vehicles. The purchase of vehicles to be scrapped is dependent on established eligibility requirements to provide assurance that a vehicle will not remain on the road or continue to produce emissions.

2.3.6 TRANSPORTATION CONTROL MEASURES

Motor vehicles are the largest source of ozone precursors in the Bay Area, and so reducing these emissions is essential to regional efforts to attain the State ozone standard and reduce transport. Motor vehicle emissions have dropped substantially over the years thanks to State and national regulations on vehicles and fuels, and motor vehicle emissions are expected to continue to decrease in the future as the vehicle fleet becomes cleaner. TCMs play a critical role in complementing State and national regulatory efforts by reducing motor vehicle use[2]. TCMs also help achieve other goals, including improved mobility and reduced congestion.

CCAA TCM Requirements

The California Clean Air Act (CCAA) emphasizes transportation control measures. CCAA legislative intent states that in developing attainment plans, air districts shall "focus particular attention on reducing the emissions from transportation and areawide emission sources" (Sec. 40910). The CCAA specifically requires air districts to "adopt, implement and enforce transportation control measures." TCMs are defined as "any strategy to reduce vehicle trips, vehicle use, vehicle miles traveled, vehicle idling, or traffic congestion for the purpose of reducing motor vehicle emissions" (Sec. 40717). TCMs must be sufficient to substantially reduce the rate of increase in vehicle trips and vehicle miles traveled (Sec. 40918). Health and Safety Code Section 40233 lays out a

[2] TCMs are distinguished from mobile source measures in that mobile source measures reduce vehicle *emission rates*, while TCMs reduce vehicle *use* by reducing vehicle trips and/or vehicle miles traveled.

process for developing a TCM emission reduction target and TCM plan when developing the 1991 Clean Air Plan. The Air District and MTC in 1991 complied with the required process. Under the CCAA, setting a TCM emission reduction target in subsequent planning cycles is discretionary. While a TCM emission reduction target was not set in subsequent plans, the TCMs have undergone extensive revision and expansion, as described below.

TCMs in the Control Strategy

The TCMs proposed for the 2005 Ozone Strategy are summarized in Table 2-4. The TCMs are divided into Phases 1 and 2 to reflect near-term and long-term implementation steps and benefits. Most projects in Phase 1 are either currently programmed or funding is otherwise expected to be available for full implementation. Some Phase 2 projects have substantial funding identified, while others are dependent on future funding sources. MTC estimated emission reductions for each phase. Phase 1 is defined as 2004-2006 and Phase 2 is defined as beyond 2006. 2015 was selected as an analysis year for emission reduction calculations, although many long-term TCM implementation steps will clearly occur before 2015, and continue beyond as well.

TABLE 2-4
Proposed Transportation Control Measures

TCM	Description	Implementing Agencies
TCM #1 SUPPORT VOLUNTARY EMPLOYER-BASED TRIP REDUCTION PROGRAMS	Phase 1 (2004 –2006): ■ Provide assistance to regional and local ridesharing organizations; advocate legislation to maintain and expand incentives (e.g., tax deductions/credits) ■ Provide assistance to employers, cities, counties: ▪ Assistance in developing/enhancing employer programs; recognition of outstanding programs ▪ Information and referral ▪ Employer networks	MTC, BAAQMD, CMAs, Cities, counties, MTC's Regional Rideshare Program, CMAs, MTC, BAAQMD
	Phase 2 (Beyond 2006): ■ Continue Phase 1 programs and enhance where feasible	Same as Phase 1
TCM #2 ADOPT EMPLOYER-BASED TRIP REDUCTION RULE	TCM deleted per Health and Safety Code Section 40929	N/A
TCM #3 IMPROVE LOCAL AND AREAWIDE BUS SERVICE	Phase 1 (2004 –2006): ■ Replace older transit buses with clean-fuel buses and retrofit existing diesel buses with diesel emission control technology ■ Sustain and expand the existing Regional Express Bus Program ■ Assist further planning work on enhanced bus and Bus Rapid Transit concepts ■ Sustain transit service to airports	MTC, Transit operators, BAAQMD MTC, Transit operators MTC, Transit operators MTC, Transit operators, Airports
	Phase 2 (Beyond 2006): ■ Restore local bus routes that were recently eliminated due to funding cutbacks ■ Implementation of new Enhanced Bus and Bus Rapid Transit services and additional Lifeline Transit services, and the expansion of Regional Express Bus Programs as funds become available	MTC, Transit operators MTC, Transit operators

TCM #4 UPGRADE AND EXPAND LOCAL AND REGIONAL RAIL SERVICE	Phase 1 (2004 –2006):	
	■ Implement MUNI Metro Third Street Light-Rail Project: light-rail extension to Bayview Hunters Point (Phase 1, initial operating segment)	MUNI
	■ Implement Caltrain Express/Rapid Rail Phase 1 ("Baby Bullet") to San Francisco	Caltrain
	■ Vasona Corridor light-rail extension from downtown San Jose to Winchester Boulevard in Campbell	SCVTA
	Phase 2 (Beyond 2006):	
	■ Extend BART to Warm Springs, BART/East Contra Costa Rail Extension, BART extension into Santa Clara County and an Oakland International Airport Connector	BART
	■ Implement MUNI Metro Third Street Light-Rail Project: light-rail transit extension to Chinatown (Phase 2, Central Subway)	MUNI
	■ Implement Caltrain Downtown Extension/ TransBay Terminal Replacement	Caltrain, TransBay Terminal JPA
	■ Implement Downtown/East Valley: Santa Clara/Alum Rock corridor and Capitol Expressway light-rail extension to Nieman Boulevard	SCVTA
	■ Implement Sonoma Marin Area Rail Transit District (SMART) commuter rail project	MTC, SMART
	■ Implement Capitol Corridor Phase 1 Intercity Rail Service: track capacity/frequency improvements from Oakland to San Jose designed to allow 16 daily round trips between Oakland and Sacramento/San Jose and Capitol Corridor Phase 2	AMTRAK/Capitol Corridor
	■ Implement Dumbarton Rail Corridor Phase 1 (diesel locomotive service connecting BART and Caltrain over a rebuilt Dumbarton rail bridge)	MTC, transit operators
	■ Implement Altamont Commuter Express (ACE) rail service expansion to 8 daily roundtrips	MTC, San Joaquin Regional Rail, Alameda and Santa Clara County CMAs

TCM #5 IMPROVE ACCESS TO RAIL & FERRIES	Phase 1 (2004 –2006): ■ Develop demonstration program for station car and bike station concepts at select regional transit centers	Transit operators, MTC, BAAQMD
	■ Determine long term funding needs for existing shuttles, encourage better coordination between shuttles and transit operators, and examine funding options for new and existing shuttles	MTC
	■ Implement Safe Routes to Transit to improve bicycle and pedestrian access	MTC, Transit operators
	■ Complete Regional Transit Connectivity Plan	MTC
	Phase 2 (Beyond 2006): ■ Continue and expand successful concepts from Phase 1 including Safe Routes to Transit improvements	MTC, Transit operators
	■ Develop a master plan for innovative secure bicycle storage strategies at key transit hubs	MTC
	■ Implement most cost effective new shuttles where funding is available	MTC, BAAQMD, Transit operators
TCM # 6 IMPROVE INTER-REGIONAL RAIL SERVICE	Phase 1 (2004 –2006): No significant changes in interregional rail service are anticipated during this phase	N/A
	Phase 2 (Beyond 2006): ■ Implement additional interregional rail service in Capitol (Auburn - Sacramento - Oakland - San Jose) Corridor and track enhancements	Capitol Corridor JPB, Amtrak, MTC, Southern Pacific
	■ Implement Altamont Commuter Express (ACE) rail service expansion to 8 daily roundtrips and track enhancements	MTC, San Joaquin Regional Rail Commission, Alameda and Santa Clara County CMAs
	■ Implement High Speed Rail Service between Los Angeles and the Bay Area	CA High Speed Rail Authority
TCM #7 IMPROVE FERRY SERVICE	Phase 1 (2004 –2006): ■ Conduct initial planning for new ferry service	WTA
	■ Implement new high-speed low emission ferry to service Vallejo to San Francisco route	Vallejo Transit

	Phase 2 (Beyond 2006):	
	■ Expand existing ferry service between: ▪ Oakland/Alameda and San Francisco ▪ Larkspur and San Francisco	WTA, Oakland/Alameda Ferry, Golden Gate Ferry,
	■ Implement new ferry service between: ▪ Berkeley/Albany and San Francisco ▪ South San Francisco and San Francisco	WTA
	■ Implement new intermodal transit hub at Vallejo Ferry Terminal	WTA, City of Vallejo, Vallejo Baylink Ferry
	■ Expand berthing capacity at the San Francisco Ferry Terminal	WTA, Port of San Francisco
	■ Implement hydrogen fuel cell ferry demonstration project from Treasure Island to San Francisco	WTA, Treasure Island Redevelopment Authority
	■ Assist ferry operators in converting vessel engines to lower emission engines	WTA, Ferry operators, MTC, BAAQMD
	■ Study and potentially implement new service between: ▪ Richmond, Hercules/Rodeo, Martinez, Redwood City and San Francisco ▪ Port Sonoma and San Francisco ▪ Oakland and San Francisco Airports	WTA
TCM #8 CONSTRUCT CARPOOL / EXPRESS BUS LANES ON FREEWAYS	Phase 1 (2004 –2006):	
	■ Expand existing HOV network, based on 2005 Transportation Improvement Program	Caltrans, MTC
	■ Implement new HOV to HOV lane connector at Rt 101/85 interchange in Mountain View	Caltrans, MTC
	■ Implement HOV support facilities such as park & ride lots at various locations	Caltrans, MTC, Transit operators
	Phase 2 (Beyond 2006):	
	■ Implement additional HOV lanes and support infrastructure identified in the Regional Transportation Plan. Special attention should be paid to express bus operations to maximize benefits for transit. Monitor and adjust occupancy requirements and hours of operation to maximize air quality and mobility benefits.	Caltrans, MTC

TCM #9 IMPROVE BICYCLE ACCESS AND FACILITIES	Phase 1 (2004 –2006):	
	■ Fund Regional Bike Plan and Safe Routes to Transit improvements	MTC, Cities, Counties, CMAs
	■ Continue TDA Article 3, TLC and TFCA funding for bike improvements	MTC, BAAQMD
	■ Develop on-line bicycle mapping tool as part of the regional 511 traveler information number	MTC
	■ Promote Bike to Work Week / Day	MTC
	■ Encourage local jurisdictions to develop safe and convenient bicycle lane and route networks, provide secure bike racks and storage, and require bicycle access and amenities as conditions of approval of development projects	Cities, Counties, MTC, Transit operators, BAAQMD
	■ Explore innovative bicycle programs, such as "station bike" or bike sharing programs at transit stations, downtowns and activity centers	Cities, Counties, MTC, Transit operators, BAAQMD
	Phase 2 (Beyond 2006):	
	■ Continue Phase 1 programs	Same as Phase 1
	■ Encourage public education about bicycle safety for both bicyclists and motorists	MTC
TCM #10 YOUTH TRANSPOR-TATION	Phase 1 (2004 –2006):	
	■ Encourage walking and bicycling to school through the Safe Routes to Schools Program	MTC's Regional Rideshare Program, School districts, Cities and Counties
	■ Encourage carpooling among high school students with cars	MTC's Regional Rideshare Program, School districts
	■ Establish special carpool formation services for parents, students and staff at Bay Area elementary and secondary schools	MTC's Regional Rideshare Program, School districts
	■ Purchase older school buses with alternatively fueled vehicles, replace old diesel school buses with cleaner engines or retrofit older school bus engines	BAAQMD, School districts
	■ Encourage shuttle programs to provide service to schools	MTC, BAAQMD, School districts
	■ Target Bay Area schools for greater participation in the Spare the Air program	BAAQMD, School districts

	Phase 2 (Beyond 2006): ■ Continue Phase 1 programs ■ Support transit ride discounts to youth and students	 Same as Phase 1 Transit operators
TCM #11 INSTALL FREEWAY TRAFFIC MANAGE-MENT SYSTEMS	Phase 1 (2004 –2006): ■ Integrate traffic management features into new freeway construction projects ■ Maintain current level of Freeway Service Patrol ■ Maintain 511 transit information service and improve and customer convenience	 Caltrans Caltrans, MTC MTC, Caltrans
	Phase 2 (Beyond 2006): ■ Extend ramp metering in major freeway corridors ■ Seek funding for full deployment of Caltrans' Traffic Operation System / Traffic Management Center project ■ Expand FSP to other routes and times of the day ■ Require traffic management elements in Caltrans freeway projects	 Caltrans Caltrans Caltrans Caltrans
TCM #12 ARTERIAL MANAGE-MENT MEASURES	Phase 1 (2004 –2006): ■ Maintain current technical assistance program for local jurisdictions that seek to retime signals, including the evaluation of bus priority treatments ■ Continue TFCA program to fund arterial management projects	 MTC BAAQMD
	Phase 2 (Beyond 2006): ■ Coordinate the timing of an additional 1,200 signals and continue updating timing plans ■ Work with bus operators to provide priority treatment along major bus routes	 Cities, Counties, Transit operators, CMAs Cities, Counties, Transit operators, CMAs

TCM #13 TRANSIT USE INCENTIVES	Phase 1 (2004 –2006): ■ Implement Translink® (universal fare card) on transit systems throughout the region ■ Implement improvements to the 511 transit information service ■ Encourage employers, transit operators, local governments and others to promote and expand employer-based transit subsidy programs like the Commuter Check and EcoPass programs ■ Improve signage at transit transfer hubs	 MTC, Transit operators MTC, Transit operators MTC's Regional Rideshare Program, transit agencies, Commuter Check Corps, employers MTC, Caltrans
	Phase 2 (Beyond 2006): ■ Deploy real-time transit arrival information ■ Increase passenger amenities at transit hubs and stops ■ Complete Alameda and Contra Costa County transit centers identified in AC Transit's *Comprehensive Service Plan*	 MTC, Transit operators MTC, Transit operators AC Transit
TCM #14 CARPOOL AND VANPOOL SERVICES AND INCENTIVES	Phase 1 (2004 –2006): ■ Maintain current programs of the Regional Ridesharing Program and increase efficiency in delivering services ■ Explore innovative concepts such as real-time ridematching using the internet ■ Explore possible provision of a regional incentive to increase ridesharing by implementing a demonstration project offering a cash incentive for new vanpools ■ Explore options for expanding medium-distance (15 – 30 miles) vanpools	 MTC's Regional Ridesharing Program MTC's Regional Ridesharing Program MTC's Regional Ridesharing Program MTC's Regional Ridesharing Program
	Phase 2 (Beyond 2006): ■ Maintain Phase 1 programs and enhance where feasible	 MTC's Regional Ridesharing Program

TCM #15 LOCAL LAND USE PLANNING AND DEVELOP-MENT STRATEGIES	Phase 1 (2004 –2006): MTC will: Implement its 5-point transportation and land use platform including a new planning grant program to fund station area plans around major transit facilities Continue implementing the TLC planning and capital grant programs and HIP program Continue providing "T-PLUS" funding to CMAs to promote community revitalization projects Utilize a Caltrans grant to examine opportunities for transit-oriented development along major transit corridors. Develop incentives and conditions to promote supportive land use policies around major new transit investments	MTC
	BAAQMD will: Continue to fund bicycle projects, traffic calming, shuttles, low emission vehicles, trip reduction programs and other clean air projects through the TFCA program Continue to provide technical assistance to local jurisdictions on air quality analyses in the environmental review process Continue to encourage cities and counties to reduce emissions from sources other than motor vehicles including lawn and garden equipment, woodstoves and fireplaces, and residential and commercial uses	BAAQMD
	ABAG will: Periodically monitor and update its Smart Growth demographic projections Promote multi-jurisdiction planning along select transit corridors to encourage transit-oriented development	ABAG
	Develop financial and other incentives and technical assistance to encourage innovative parking strategies such as reduced parking, parking fees, parking cash-out, shared parking and other parking programs	MTC, BAAQMD, ABAG in collaboration with cities and counties
	Pursue legislative changes to remove barriers and provide incentives for smart growth	MTC, BAAQMD, ABAG in collaboration with cities and counties
	Promote carsharing as a way to reduce parking requirements	MTC, BAAQMD, ABAG, cities and counties
	Monitor indirect source mitigation programs in other regions for Bay Area feasibility	BAAQMD
	Provide technical assistance to local government agencies	MTC, BAAQMD, ABAG
	Publicize noteworthy examples of local clean air plans, policies and programs, as well as endorse noteworthy development projects	BAAQMD, MTC, ABAG
	Study opportunities to promote location efficient mortgages (LEMs) to encourage home purchases near transit	MTC, BAAQMD, ABAG

	Phase 2 (Beyond 2006): ■ Continue the programs in Phase 1 and refine and expand them as appropriate	MTC, BAAQMD, ABAG in collaboration with cities and counties
TCM #16 PUBLIC EDUCATION / INTERMIT-TENT CONTROL MEASURES	Phase 1 (2004 –2006): ■ Continue Spare the Air notices to media, employers, public agencies and individuals, with an emphasis on ROG reductions, obeying freeway speed limits in electronic freeway signs and other outreach efforts	BAAQMD
	■ Continue to expand the Spare the Air employer network	BAAQMD
	■ Provide free morning commutes to all riders of participating Bay Area transit providers up to 5 non-holiday, weekday Spare the Air Days	BAAQMD, MTC and Transit operators
	■ Expand STA notices to add emphasis on ROG reductions, obeying freeway speed limits, and discouraging use of pleasure craft	BAAQMD
	■ Expand the Clean Air Consortium to include more cities and counties, as well as other public agencies	BAAQMD
	■ Target major commercial airports and their tenants for greater participation in the Spare the Air program	BAAQMD, Airports
	■ Increase coordination between the Bay Area's Spare the Air program with the San Joaquin Valley STA Program	BAAQMD, San Joaquin Valley STA Program
	■ Continue public education program on the proper maintenance and operation of motor vehicles to reduce air pollution	BAAQMD
	■ Continue the Bay Area Clean Air Partnership (BayCAP) shuttle project to inventory existing shuttle programs, provide coordination and assistance, and promote "best practices" among shuttle operators	BAAQMD
	■ Discourage the use of recreational watercraft on STA days	BAAQMD
	■ Continue gasoline-powered lawnmower buyback incentive programs	BAAQMD
	■ Educate the public about ways to maintain and operate motor vehicles to reduce air pollution	BAAQMD

	Phase 2 (Beyond 2006): ■ Continue Phase 1 programs and expand depending on effectiveness and resources available ■ Study effectiveness and costs of free transit on all Spare the Air days ■ Explore possible legislative approaches to formalize and strengthen episodic approaches	 BAAQMD BAAQMD, MTC and Transit operators BAAQMD, MTC
TCM #17 CONDUCT DEMON-STRATION PROJECTS	Phase 1 (2004 –2006): Promote demonstration projects to develop new strategies to reduce motor vehicle emissions. Potential projects include ▪ Low and zero emission vehicles and LEV refueling infrastructure ▪ Hydrogen fuel cell technology ▪ Gas cap replacement program for older cars ▪ Heavy duty diesel vehicle idling ▪ Refuse truck control technology ▪ Carsharing	 BAAQMD, MTC, Caltrans, FHWA
	Phase 2 (Beyond 2006): ■ Monitor Phase 1 projects and expand depending on effectiveness and resources available	 Same as Phase 1
TCM #18 IMPLEMENT TRANSPOR-TATION PRICING REFORM	Phase 1 (2004 –2006): ■ Advocate for legislative authority to develop and promote measures to discourage driving, such as: ▪ Higher bridge tolls ▪ Congestion pricing ▪ Gas tax increase ▪ Parking pricing	 BAAQMD, MTC, business community and other stakeholders
	Phase 2 (Beyond 2006): ■ Advocate for legislative authority to develop and promote revenue measures for: ▪ Continuation of Phase 1 elements ▪ High Occupancy Toll lanes ▪ Gas tax increase / VMT fees ▪ Taxes on diesel fuel ▪ Emissions-based vehicle registration fees ▪ Parking fees	 BAAQMD, MTC, business community and other stakeholders

TCM #19 IMPROVE PEDESTRIAN ACCESS AND FACILITIES	Phase 1 (2004 –2006):	
	■ Review and comment on general/specific plan policies to promote development patterns that encourage walking and circulation policies	BAAQMD, MTC, cities and counties
	■ Emphasize pedestrian travel and encourage amending zoning ordinances to include pedestrian-friendly design standards	BAAQMD, MTC, ABAG, cities and counties
	■ MTC will continue to: ▪ Fund local pedestrian improvement projects through the TLC program ▪ Support the Regional Pedestrian Committee and associated pedestrian safety programs ▪ Support Safe Routes to Schools	MTC
	■ TFCA program will continue to fund pedestrian improvement projects to reduce motor vehicle trips and emissions	BAAQMD
	Phase 2 (Beyond 2006):	
	■ Continue to identify and fund planning projects that enhance pedestrian movement in neighborhoods, downtowns and near transit stops	MTC, BAAQMD in collaboration with cities and counties
	■ Continue funding specific improvements through a variety of funding sources	MTC, BAAQMD in collaboration with cities and counties
	■ Continue to support Safe Routes to Schools	MTC, BAAQMD in collaboration with cities and counties
TCM #20 PROMOTE TRAFFIC CALMING MEASURES	Phase 1 (2004 –2006):	
	■ Implement traffic calming projects such as: ▪ Pedestrian-exclusive streets ▪ Residential and neighborhood traffic calming measures ▪ Arterial and major route traffic calming measures	MTC, BAAQMD, Cities, Counties
	■ Include traffic calming strategies in the transportation and land use elements of general and specific plans	MTC, BAAQMD, Cities, Counties
	■ Encourage area-wide traffic calming plans and programs	MTC, BAAQMD, Cities, Counties
	■ Include traffic calming strategies in capital improvements programs	MTC, BAAQMD, Cities, Counties
	Phase 2 (Beyond 2006):	
	■ Continue the programs in Phase 1 and refine and expand them as appropriate	N/A

2.3.7 EMISSION REDUCTIONS

A summary of emission reductions from the control measures proposed in the 2005 Ozone Strategy is provided in Table 2-5.

TABLE 2-5

Emission Reductions of Proposed Control Measures

CM#	Title	VOC Reductions (tons/day) 2006	NOx Reductions (tons/day) 2006
STATIONARY AND AREA SOURCE MEASURES			
Industrial – Commercial Processes			
SS-1	Auto Refinishing	0.7	-
SS-2	Graphic Arts Operations	0.15	-
SS-3	High Emitting Spray Booths	0.5	-
SS-4	Polyester Resin Operations	0.3	-
SS-5	Wood Products Coating	0.68	-
Petroleum Products Distribution and Processing			
SS-6	Flares (ADOPTED 7/20/05)	TBD*	TBD*
SS-7	Gasoline Bulk Terminals and Plants	0.14	-
SS-8	Marine Loading Operations	0.7 – 1.0	-
SS-9	Organic Liquid Storage Tanks	TBD*	-
SS-10	Pressure Relief Devices	0.001	-
SS-11	Wastewater Systems (ADOPTED 9/15/04)	2.1	-
Combustion Processes			
SS-12	Boilers Rated Between 5 and 10 MM BTU/hr	-	0.5 – 1.0
SS-13	Large Water Heaters and Small Boilers	-	0.39
SS-14	Stationary Gas Turbines	-	1.2
Education Programs			
SS-15	Energy Conservation	Unknown	Unknown
MOBILE SOURCE MEASURES			
MS-1	Diesel Equipment Idling Ordinance	0.13	1.96
MS-2	Green Contracting	TBD*	TBD*
MS-3	Low-Emissions Vehicle Incentives	0.03	0.6
MS-4	Vehicle Buy-Back Program	0.48	0.31
TRANSPORTATION CONTROL MEASURES			
TCM-1	Support Voluntary Employer Based Trip Reduction Programs	0.53	0.57
TCM-3	Improve Local and Area-wide Bus Service	0.42	1.13
TCM-4	Improve Regional Rail Service	0.23	0.21
TCM-5	Improve Access to Rail and Ferries	0.17	0.15
TCM-6	Improve Interregional Rail Service	-	-
TCM-7	Improve Ferry Service	-	-

TABLE 2-5 (CONTINUED)
Emission Reductions of Proposed Control Measures

CM#	Title	VOC Reductions (tons/day)	NOx Reductions (tons/day)
TCM-8	Construct Carpool/Express Bus Lanes on Freeways	-	-
TCM-9	Improve Bicycle Access and Facilities	0.04	0.03
TCM-10	Youth Transportation	0.11	0.09
TCM-11	Install Freeway Traffic Management System	0.04	0.11-0.12
TCM-12	Arterial Management Measures	0.06 – 0.12	0.06 – 0.11
TCM-13	Transit Use Incentives	0.02-0.12	0.02-0.10
TCM-14	Carpool and Vanpool Services and Incentives	0.01	0.01
TCM-15	Local Land Use Planning and Development Strategies	0.09	0.14
TCM-16	Public Education/Intermittent Control Measures	1.9**	2.0**
TCM-17	Conduct Demonstration Projects	-	-
TCM-18	Transportation Pricing Reform	-	-
TCM-19	Improve Pedestrian Access and Facilities	0.04	0.02
TCM-20	Promote Traffic Calming	-	-

* TBD – Emission reductions to be determined

** Emissions reduction figures for TCM 16: Public Education/Intermittent Control Measures were calculated in tons per day based on emissions reduced on Spare the Air days, which occur approximately seven days per year.

2.3.8 FURTHER STUDY MEASURES

Further study measures are measures for which insufficient information was available during the development of the control strategy to allow for a comprehensive review. For example, emissions data for some source categories or the emissions reduction potential of some control measures may be uncertain. In these cases, further study may be warranted if the other aspects of a suggested control, such as public acceptability and adverse environmental impacts appear positive. The Ozone Strategy includes the description of Further Study Measures that have been identified and commits staff to follow up on and continue to evaluate the further study measures, and move forward with any that are deemed feasible as a result of the study. Therefore, the potential environmental impacts associated with Further Study Measures are not evaluated in this EIR as they are not included as commitments in the Ozone Strategy. Additional CEQA review would be required if any of the Further Study Measures are proposed to be implemented.

CHAPTER 3

ENVIRONMENTAL SETTING, IMPACTS AND MITIGATION MEASURES

Introduction
Aesthetics
Agricultural Resources
Air Quality
Biological Resources
Cultural Resources
Geology and Soils
Hazards and Hazardous Materials
Hydrology and Water Quality
Land Use Planning
Mineral Resources
Noise
Population and Housing
Public Services
Recreation
Transportation/Traffic
Utilities and Service Systems

3.0 ENVIRONMENTAL SETTING, IMPACTS AND MITIGATION MEASURES

3.1 INTRODUCTION

CEQA provisions for program EIRs in connection with issuance of rules, regulations, plans, or other general criteria to govern the conduct of a continuing program, including adoptions of broad policy programs are separate, from the provisions of EIRs prepared for specific types of projects (e.g., land use projects) (CEQA Guidelines §15168). The EIR for the 2005 Ozone Strategy is a program EIR because it examines the environmental effects of proposed control measures that will ultimately be issued as rules or regulations and promulgated as part of a continuing ongoing regulatory program.

The degree of specificity required in an EIR corresponds to the degree of specificity involved in the underlying activity described in the EIR (CEQA Guidelines §15146). Because the level of information regarding potential impacts from control measures recommended in the 2005 Ozone Strategy is relatively general at this time, the environmental impact forecasts are also general or qualitative in nature.

CEQA Guidelines §15125(a) requires that an EIR include a description of the physical environmental conditions in the vicinity of the project, as they exist at the time the notice of preparation is published. This environmental setting will normally constitute the baseline physical conditions by which a lead agency determines whether an impact is significant. The description of the environmental setting shall be no longer than is necessary to gain an understanding of the significant effects of the proposed project and its alternatives.

The CEQA Guidelines also require EIRs to identify significant environmental effects that may result from a proposed project [CEQA Guidelines §15126.2(a)]. Direct and indirect significant effects of a project on the environment should be identified and described, with consideration given to both short- and long-term impacts. If significant adverse environmental impacts are identified, the CEQA Guidelines require a discussion of measures that could either avoid or substantially reduce any adverse environmental impacts to the greatest extent feasible (CEQA Guidelines §15126.4).

This chapter describes the existing environmental setting, analyzes the potential environmental impacts, and recommends mitigation measures, when significant environmental impacts have been identified. Each of the resources identified in the CEQA checklist (CCR Title 14, Chapter 3, §15000 et seq., Appendix G) has been analyzed in this chapter.

Included for each impact category is a discussion of the environmental setting, significance criteria, project-specific impacts, feasible project-specific mitigation (if necessary and available), impacts remaining after mitigation (if any), cumulative impacts (if any) and feasible cumulative impact mitigation (if necessary and available).

In order to address the full range of potential environmental impacts several assumptions were made for purposes of evaluation. All control equipment that could be used to comply with a particular control measure were evaluated. In practice, there are typically a number of ways to comply with rule requirements.

Every control measure in the 2005 Ozone Strategy was evaluated to determine whether or not it has the potential to generate adverse environmental impacts (see Appendix C & D of the 2005 Ozone Strategy). A table has been prepared in each subchapter where control measures have been identified that have the potential to generate significant adverse impacts to that environmental resource. Table 3.1-1 lists the various control measures which were evaluated and determined not to have significant adverse impacts on the environment.

TABLE 3.1-1

Control Measures with No Significant Adverse Environmental Impacts

Control Measure	Control Measure Description	Reason Not Significant
SS 15	Promote Energy Conservation	1
MS 1	Diesel Equipment Idling Ordinance	1,2
MS 2	Green Contracting	1
TCM 10	Youth Transportation	1
TCM 12	Arterial Management Measures	1
TCM 14	Carpool and Vanpool Services and Incentives	1
TCM 16	Public Education/Intermittent Control Measures	1
TCM 18	Implement Transportation Pricing Reform	3
TCM 19	Improve Pedestrian Access and Facilities	1,2

1. Control technologies do not generate adverse impacts.
2. Changes in operating practices with no impact identified.
3. Control measure is aimed at increasing fees to decrease travel and related emissions with no specific impact identified.

There are several reasons why the control measures in Table 3.1-1 are not expected to generate significant adverse impacts. First, the primary control methods of compliance do not involve control equipment that would generate any adverse secondary or cross media impacts. For example, SS 15 - Promote Energy Conservation would promote energy conservation primarily through education, which is not expected to generate secondary impacts.

Another reason control measures in Table 3.1-1 were determined to have no significant adverse impacts is because they consist primarily of changes in operating practices, and are primarily administrative in nature. For example, TCM 10 – will improve youth mobility by encouraging walking and bicycling to school, encouraging carpooling, and supporting transit ride discounts to youth and students. Better education or increased

incentives would not generate physical secondary impacts. TCM 18 – Implement Transportation Pricing Reform would increase fees for certain transportation activities (e.g., higher bridge tolls, congestion pricing and gas tax increases) to discourage travel in single occupancy vehicles. The imposition of fees would not generate environmental impacts.

In addition, there is insufficient information on one control measure proposed in the 2005 Ozone Strategy to determine whether it would have any significant adverse environmental impacts. TCM 17 – Conduct Demonstration Projects, would undertake various demonstration projects and studies to further develop strategies that will ultimately be needed to help achieve State air quality standards. Demonstration projects will be aimed at mobile sources and examples of demonstration projects that might be explored include promotion of the use of low and zero emission vehicles, parts replacement for middle aged cars, reduced heavy duty diesel idling, and car-sharing. Because the demonstration projects have not been identified, it is difficult to determine what, if any, impacts could be expected from these projects. Therefore, the impacts of this control measure identified in Table 3.1-2 would be considered speculative and no further environmental analysis is required at this time (CEQA Guidelines §15145).

TABLE 3.1-2

Control Measure Whose Impacts are Speculative

Control Measure	Control Measure Description
TCM 17	Conduct Demonstration Projects

3.2 AESTHETICS

3.2.1 ENVIRONMENTAL SETTING

The BAAQMD covers all of Alameda, Contra Costa, Marin, San Francisco, San Mateo, Santa Clara, and Napa Counties, and portions of southwestern Solano and southern Sonoma Counties. The area of coverage is vast (about 5,600 square miles) so that land uses vary greatly and include commercial, industrial, residential, agricultural, and open space uses.

The views of the San Francisco Bay Area are varied, unique, and recognized by many in the region and beyond. The basin formed by the coastal range, East Bay Hills, and the Bay itself, are prominent physical features of the region. To the west, the Pacific Ocean and the Coastal Range stretching from Mt. Tamalpais in the north to the Santa Cruz Mountains in the south, dominate the visual setting. To the east the Diablo Range dramatically punctuated by Mount Diablo provides a much different character. In the north, the vineyards of Napa and Sonoma counties are unique and draw visitors from

around the world. Many man-made features in the Bay Area, e.g., the Golden Gate and Bay Bridges and the San Francisco skyline in particular, also provide aesthetic resources.

The variety of natural features, their topographic variation and the different types of development within them provide the Bay Area with significant visual resources. The Bay Area sits along the Pacific coast with several branches of the Coast Range dividing it into valleys, plains, and water bodies. The largest of these valleys contains San Francisco Bay while at the eastern edge of the region is the Central Valley, an extremely flat plain lying between the Coast Range and the Sierra Nevada Mountains. The hills of the Coast Range provide expansive views of the valleys and plains, revealing a variety of development types, including urban areas along the Bay plains and inland valleys, agricultural lands, and protected open space, and natural areas.

3.2.2 SIGNIFICANCE CRITERIA

The proposed project impacts on aesthetics will be considered significant if:

> The project will block views from or damage views of a scenic highway or corridor.
>
> The project will adversely affect the visual continuity of the surrounding area.
>
> The impacts on light and glare will be considered significant if the project adds lighting which would add glare to residential areas or sensitive receptors.

3.2.3 ENVIRONMENTAL IMPACTS

This subchapter evaluates aesthetic impacts that could occur as a consequence of efforts to improve air quality. Table 3.2-1 lists the control measures with potential aesthetic impacts.

The proposed stationary source control measures in the Bay Area 2005 Ozone Strategy are not expected to adversely affect scenic vistas in the Air District; damage scenic resources, including but not limited to trees, rock outcroppings, or historic buildings within a scenic highway; or substantially degrade the visual character of a site or its surroundings. Stationary source control measures typically affect industrial, institutional, or commercial facilities located in appropriately zoned areas which are not usually located in areas with scenic resources. Further, modifications typically occur inside the buildings at the affected facilities, or because of the nature of the business (e.g., commercial or industrial) can easily blend with the facilities with little or no noticeable effect on adjacent areas. The 2005 Ozone Strategy may have a beneficial effect on scenic resources by improving visibility as well as improving air quality.

TABLE 3.2-1

Control Measures with Potential Aesthetic Impacts

Control Measures	Control Measure Description	Control Methodology	Aesthetic Impact
SS 9	Organic Liquid Storage Tanks	Add domes to tanks, improved standards for tank cleaning, I&M programs	Increased tank height could result in aesthetic impacts
TCM 4	Upgrade and Expand Local and Regional Rail Service	Construction of additional rail facilities, electrification of rail services	Construction of new rail facilities could impact undeveloped areas
TCM 6	Improve Interregional Rail Service	Construction of new rail facilities	Construction of new rail lines could impact undeveloped areas
TCM 7	Improve Ferry Service	Construction of new facilities, use of low emission ferries, and add-on controls	Impacts to scenic waterfront areas
TCM 8	Construct Carpool/Express Bus Lanes on Freeways	Construction of new High Occ-upancy Vehicle (HOV) lanes	Construction of new freeway lanes could impact views

Control Measure SS 9 – Organic Liquid Storage Tanks, focuses on enhanced control requirements for storage tanks. Control measures for tanks include retrofitting external floating roof tanks with domes to reduce evaporation from air movement across the tank, imposing more stringent tank cleaning standards, requiring external floating roof tanks to be retrofitted with vapor recovery, encouraging more frequent self-inspections, and phasing out riveted tanks currently in service. The addition of domes to organic liquid storage tanks may have an effect on some views in the area surrounding the tanks due to increased height of the existing tanks. The increased height of existing tanks is not expected to result in significant aesthetic impacts because the storage tanks are generally located in existing commercial or industrial areas. Commercial and industrial areas generally are not located in areas with scenic resources.

The proposed stationary source control measures in the 2005 Ozone Strategy are not expected to create additional demand for new lighting or exposed combustion that could create glare that could adversely affect day or nighttime views in any areas. Facilities affected by BAAQMD control measures for stationary sources typically make modifications in the interior of an affected facility, so any new light sources would typically be inside a building or not noticeable because of the presence of existing light sources. Further, affected commercial or industrial facilities would be located in appropriately zoned areas that are not usually located next to residential areas, so new light sources, if any, would not be noticeable to residents. There would be some increase in lighting for construction associated with the transportation control measures, since construction of traffic improvements is often done at night to avoid the peak traffic hours during the day. These construction activities would be temporary and the lighting would cease following completion of construction activities, so that no significant adverse impacts would be expected.

Construction of some of the transportation control measures could result in adverse visual impacts. Construction of additional ferry terminals under TCM 7 – Improve Ferry Service could have potentially significant impacts on views of the Bay or the visual character of waterfront areas, after mitigation. The expanded and enhanced ferry terminals and services could result in significant light and glare impacts throughout the San Francisco Bay Area [Water Transportation Authority (WTA), 2003]. However, most of the proposed terminal sites have existing maritime uses, with the exception of the Hercules/Rodeo site. Other TCMs, e.g., TCM 4 – Upgrade and Expand Local and Regional Rail Service and TCM 6 – Improve Interregional Rail Service, would expand local and regional rail service and could result in construction of new rail lines and new rail stations that could change the visual character of scenic areas. TCM 8 – Construct Carpool/Express Bus Lanes on Freeways, would construct additional carpool and express bus lanes on freeways that could significantly affect visual resources by adding or expanding transportation facilities in rural or open space areas, blocking views from adjoining areas, blocking or intruding into important vistas along roadways, and changing the scale, character, and quality of designated or eligible scenic highways.

Conclusion: Based upon the above considerations and the impact evaluation criteria, potentially significant adverse aesthetics impacts could occur due to implementation of the 2005 Ozone Strategy associated with TCM 4 – Upgrade and Expand Local and Regional Rail Service, TCM 6 – Improve Interregional Rail Service, TCM 7 – Improve Ferry Service, and TCM 8 – Construct Carpool/Express Bus Lanes on Freeways.

3.2.4 MITIGATION MEASURES

The visual impacts associated with some of the TCMs in the 2005 Ozone Strategy are potentially significant. The mitigation measures developed by the WTA (2003) for construction of ferry terminals include the following:

A1 Where feasible, the following shall be included in ferry terminal design:

- Locate terminal facilities so as not to obstruct or detract from views of the Bay from nearby public thoroughfares;
- Design terminals and layout to integrate with the surrounding landscape and historical structures to preserve, and take advantage of, existing views of the Bay and shoreline;
- Design terminal facilities to provide new or enhanced point access areas or view areas such as piers, platforms, and walkways;
- Design and site terminals so as to maintain and enhance the visual quality of the shoreline and visual public access to the Bay; and
- Vessels should be standardized to support system-wide operations and to work interchangeably at all terminals. Vessel berthing should be configured so as to allow maximum feasible visual access to the Bay.

A2 The WTA established Intermodal and Architectural Design Guidelines shall be considered in the planning and design of new and enhanced ferry terminals.

Mitigation measures for other transportation projects should include the following:

A3 Design projects to minimize contrasts in scale and massing between the project, and surrounding natural forms and development. Site or design projects to minimize their intrusion into important view sheds.

A4 Use natural landscaping to minimize contrasts between the project and surrounding areas. Wherever possible, develop interchanges and transit lines at or below grade of the surrounding land to limit view blockage. Contour the edges of major cut and fill slopes to provide a more natural looking finished profile.

A5 Design landscaping along highway and transportation corridors to add significant natural elements and visual interest to soften the hard edged, linear travel experience that would otherwise occur.

A6 Complete design studies for projects in designated or eligible Scenic Highway corridors. Consider the complete highway system and develop mitigation measures to minimize impacts on the quality of the views or visual experience that originally qualified the highway for scenic designation.

It is not expected that these mitigation measures would eliminate all visual impacts and the implementation of some transportation improvements may result in visual changes that will block or damage views of scenic resources or adversely affect visual continuity in some areas following mitigation.

3.2.5 CUMULATIVE AESTHETIC IMPACTS

Implementation of the various transportation improvement projects and regional growth in general could result in indirect visual impacts by serving urban development that could significantly change the visual character of some areas adjacent to the region's existing urban limits, especially where new development would occur on visually prominent hillsides or in existing, open rural lands. These types of control measures in aggregate would serve new urban development and add to cumulative regional impacts. In addition, other transportation control measures may result in individually minor visual impacts locally. Collectively, these individually minor visual impacts may become significant over time. Local land use agencies are responsible for the approval of urban development. These agencies would usually apply development standards and guidelines to maintain compatibility with surrounding natural areas, including site coverage, building height and massing, building materials and color, landscaping, site grading, etc., in visually sensitive areas to minimize visual impacts.

It should be noted that the 2005 Ozone Strategy and other air quality plans, rules and regulations may have a beneficial effect on scenic resources by improving visibility as well as improving air quality.

3.2.6 CUMULATIVE AESTHETIC MITIGATION MEASURES

Mitigation measures for aesthetic impacts would be the responsibility of local land use agencies and would vary by agency and type of project. No additional feasible mitigation measures, other than the development standards and guidelines imposed by local land use agencies, have been identified. Therefore, mitigation measures are not expected to reduce this potentially significant adverse cumulative impact on visual resources to less than significant, since the cumulative effect of development would be to alter the visual character of many parts of the Bay Area for a number of years.

3.3 AGRICULTURAL RESOURCES

3.3.1 ENVIRONMENTAL SETTING

Land uses in the Air District vary between commercial, industrial, residential, agricultural and open spaces. Agricultural land uses are located in the less urbanized portions of the Bay Area, including the vineyards in Napa and Sonoma counties and include agricultural lands under Williamson Act contracts.

The facilities affected by the proposed control measures are expected to be located in the commercial and industrial areas within the Bay Area. Agricultural resources are generally not located in the vicinities of or within the affected commercial and industrial areas.

3.3.2 SIGNIFICANCE CRITERIA

Proposed project impacts on agricultural resources will be considered significant if any of the following conditions are met:

> The proposed project conflicts with existing zoning or agricultural use or Williamson Act contracts.
>
> The proposed project will convert prime farmland, unique farmland or farmland of statewide importance as shown on the maps prepared pursuant to the farmland mapping and monitoring program of the California Resources Agency, to non-agricultural use.
>
> The proposed project would involve changes in the existing environment, which due to their location or nature, could result in conversion of farmland to non-agricultural uses.

3.3.3 ENVIRONMENTAL IMPACTS

This subchapter evaluates agricultural impacts that could occur as a consequence of efforts to improve air quality. No control measures are expected to result in impacts to agricultural resources.

BAAQMD stationary source control measures typically affect existing commercial or industrial facilities, so they are not expected to generate any new construction of buildings or other structures that would require conversion of farmland to non-agricultural use or conflict with zoning for agricultural uses or a Williamson Act contract. There are no provisions in the proposed 2005 Ozone Strategy which would affect or conflict with existing land use plans, policies, or regulations or require conversion of farmland to non-agricultural uses. Land use, including agriculture-related uses, and other planning considerations are determined by local governments and no land use or planning requirements will be altered by the proposed project.

Some of the traffic control measures could require construction of traffic improvement projects. These construction activities would be expected to occur along existing transportation corridors and within existing right-of-ways, minimizing impacts into undeveloped lands (e.g., agricultural lands). Construction of new transportation facilities and terminals are expected to be sited in urban areas to provide service to a large population as opposed to more rural, agricultural areas. TCM 15 – Local Land Use Planning and Development Strategies would attempt to influence land use patterns and reduce the time and distance traveled between home, jobs, schools, shops and services. TCM 15 would also encourage compact, mixed use infill development near transit stations, transit corridors and town centers and discourage urban sprawl into non-urban areas, including agricultural lands, providing a potential benefit to agricultural properties.

Conclusion: Based upon the above considerations and significance criteria, significant adverse impacts to agricultural resources are not expected due to implementation of the control measures within the 2005 Ozone Strategy.

3.3.4 MITIGATION MEASURES

No significant impacts to agricultural resources were expected so no mitigation measures are required.

3.3.5 CUMULATIVE AGRICULTURAL RESOURCES

The 2005 Ozone Strategy and other air quality programs generally provide reduction in emissions from stationary and mobile sources providing a regional air quality benefit. On a cumulative basis, these programs are not expected to generate any new construction of buildings or other structures that would require conversion of farmland to non-agricultural use or conflict with zoning for agricultural uses or Williamson Act contracts. TCM 15 – Local Land Use Planning and Development Strategies would encourage

compact, mixed use infill development near transit stations, transit corridors and town centers and discourage urban sprawl into non-urban areas, including agricultural lands, providing a potential benefit to agricultural properties. General population growth in the area has lead to development and conversion of agricultural land to urban development. However, this development is related to general growth and not air quality controls or plans. No cumulative impacts on agricultural resources are expected.

3.3.6 CUMULATIVE MITIGATION MEASURES FOR AGRICULTURAL RESOURCES

No significant cumulative impacts to agricultural resources are expected so no mitigation measures are required.

3.4 AIR QUALITY

3.4.1 ENVIRONMENTAL SETTING

3.4.1.1 Criteria Air Pollutants

3.4.1.1.1 Ambient Air Quality Standards and Health Effects

It is the responsibility of the BAAQMD to ensure that State and federal ambient air quality standards are achieved and maintained in its geographical jurisdiction. Health-based air quality standards have been established by California and the federal government for the following criteria air pollutants: ozone, carbon monoxide (CO), nitrogen dioxide (NO_2), particulate matter (PM), sulfur dioxide (SO_2) and lead. These standards were established to protect sensitive receptors with a margin of safety from adverse health impacts due to exposure to air pollution. The State standards (SAAQS) are more stringent than the federal standards, and in the case of PM10 and SO_2 far more stringent. California has also established standards for sulfate, visibility, hydrogen sulfide, and vinyl chloride.

The State and National Ambient Air Quality Standards (NAAQS) for each of these pollutants and their effects on health are summarized in Table 3.4-1.

Since the Bay Area 2005 Ozone Strategy focuses on ozone, the inventory discussion is focused on ozone and "ozone precursors." Ozone is not emitted directly from pollution sources. Instead ozone is formed in the atmosphere through complex chemical reactions between hydrocarbons, or reactive organic gases (ROG, also commonly referred to as volatile organic compounds or VOC), and nitrogen oxides (NOx), in the presence of sunlight. ROG and NOx are referred to as ozone precursors.

TABLE 3.4-1

Federal and State Ambient Air Quality Standards

	STATE STANDARD	FEDERAL PRIMARY STANDARD	MOST RELEVANT EFFECTS
AIR POLLUTANT	CONCENTRATION/ AVERAGING TIME	CONCENTRATION/ AVERAGING TIME	
Ozone	0.09 ppm, 1-hr. avg. > 0.070 ppm, 8-hr	0.08 ppm, 8-hr avg>	(a) Short-term exposures: (1) Pulmonary function decrements and localized lung edema in humans and animals (2) Risk to public health implied by alterations in pulmonary morphology and host defense in animals; (b) Long-term exposures: Risk to public health implied by altered connective tissue metabolism and altered pulmonary morphology in animals after long-term exposures and pulmonary function decrements in chronically exposed humans; (c) Vegetation damage; (d) Property damage
Carbon Monoxide	9.0 ppm, 8-hr avg. > 20 ppm, 1-hr avg. >	9 ppm, 8-hr avg.> 35 ppm, 1-hr avg.>	(a) Aggravation of angina pectoris and other aspects of coronary heart disease; (b) Decreased exercise tolerance in persons with peripheral vascular disease and lung disease; (c) Impairment of central nervous system functions; (d) Possible increased risk to fetuses
Nitrogen Dioxide	0.25 ppm, 1-hr avg. >	0.053 ppm, ann. avg.>	(a) Potential to aggravate chronic respiratory disease and respiratory symptoms in sensitive groups; (b) Risk to public health implied by pulmonary and extra-pulmonary biochemical and cellular changes and pulmonary structural changes; (c) Contribution to atmospheric discoloration
Sulfur Dioxide	0.04 ppm, 24-hr avg.> 0.25 ppm, 1-hr. avg. >	0.03 ppm, ann. avg.> 0.14 ppm, 24-hr avg.>	Bronchoconstriction accompanied by symptoms which may include wheezing, shortness of breath and chest tightness, during exercise or physical activity in persons with asthma
Suspended Particulate Matter (PM10)	20 $\mu g/m^3$, ann. arithmetic mean > 50 $\mu g/m^3$, 24-hr average>	50 $\mu g/m^3$, annual arithmetic mean > 65 $\mu g/m^3$, 24-hr avg.>	(a) Excess deaths from short-term exposures and exacerbation of symptoms in sensitive patients with respiratory disease; (b) Excess seasonal declines in pulmonary function, especially in children
Suspended Particulate Matter (PM2.5)	12 $\mu g/m^3$, ann. Arithmetic mean	15 $\mu g/m^3$, annual arithmetic mean> 150 $\mu g/m^3$, 24-hour average>	Decreased lung function from exposures and exacerbation of symptoms in sensitive patients with respiratory disease; elderly; children.
Sulfates	25 $\mu g/m^3$, 24-hr avg. >=		(a) Decrease in ventilatory function; (b) Aggravation of asthmatic symptoms; (c) Aggravation of cardio-pulmonary disease; (d) Vegetation damage; (e) Degradation of visibility; (f) Property damage
Lead	1.5 $\mu g/m^3$, 30-day avg. >=	1.5 $\mu g/m^3$, calendar quarter>	(a) Increased body burden; (b) Impairment of blood formation and nerve conduction
Visibility-Reducing Particles	In sufficient amount to give an extinction coefficient >0.23 inverse kilometers (visual range to less than 10 miles) with relative humidity less than 70%, 8-hour average (10am – 6pm PST)		Nephelometry and AISI Tape Sampler; instrumental measurement on days when relative humidity is less than 70 percent

U.S. EPA requires CARB and BAAQMD to measure the ambient levels of air pollution to determine compliance with the NAAQS. To comply with this mandate, the BAAQMD monitors levels of various criteria pollutants at 26 monitoring stations within the San Francisco Bay Area. A summary of the 2004 maximum concentration and number of days exceeding State and federal ambient air standards at the BAAQMD monitoring stations are presented in Table 3.4-2.

Air quality conditions in the San Francisco Bay Area have improved since the Air District was created in 1955. Ambient concentrations of air pollutants and the number of days on which the region exceeds air quality standards have fallen dramatically (see Table 3.4-3). The Air District is in attainment of the State and federal ambient air quality standards for CO, nitrogen oxides (NOx), and sulfur oxides (SOx). The Air District is unclassified for the federal 24-hour PM10 standard. Unclassified means that the monitoring data were incomplete and at the time of designations did not support a designation of attainment or non-attainment. However, the Air District does not comply with the State 24-hour PM10 standard.

The 2004 air quality data from the BAAQMD monitoring stations are presented in Table 3.4-2. All monitoring stations were below the State standard and federal ambient air quality standards for CO, NO_2, and SO_2. The Bay Area is designated as a non-attainment area for the California 1-hour ozone standard. The State 1-hour standard was exceeded on seven days in 2004 in the Air District, most frequently in the Eastern District (Livermore) (see Table 3.4-2).

All monitoring stations were in compliance with the federal PM10 standards. The California PM10 standards were exceeded on seven days in 2004, most frequently in San Jose. The Air District exceeded the federal PM2.5 standard on one day (at Concord) in 2004 (see Table 3.4-2).

TABLE 3.4-2
Bay Area Air Pollution Summary 2004

MONITORING STATIONS	Ozone							CARBON MONOXIDE			NITROGEN DIOXIDE			SULFUR DIOXIDE			PM10				PM2.5				
	Max 1-Hr	Nat Days	Cal Days	3-Yr Avg	Max 8-Hr	Nat Days	3-Yr Avg	Max 1-Hr	Max 8-Hr	Nat/ Cal Days	Max 1-Hr	Ann Avg	Nat/ Cal Days	Max 24-Hr	Ann Avg	Nat/ Cal Days	Ann Avg	Max 24-Hr	Nat Day	Cal Days	Max 24-Hr	Nat Days	3-Yr Avg	Ann Avg	3-Yr Avg
NORTH COUNTIES	(pphm)							(ppm)			(pphm)			(ppb)			($\mu g/m^3$)				($\mu g/m^3$)			($\mu g/m^3$)	
Napa	9	0	0	0.0	7	0	6.6	3.7	2.0	0	6	1.1	0	--	--	--	20.7	60	0	1	--	--	--	--	--
San Rafael	9	0	0	0.0	6	0	4.9	3.2	2.0	0	6	1.5	0	--	--	--	17.9	52	0	1	--	--	--	--	--
Santa Rosa	8	0	0	0.0	6	0	5.1	2.7	1.6	0	5	1.1	0	--	--	--	18.0	48	0	0	27	0	32	8.3	9
Vallejo	10	0	1	0.0	7	0	6.5	4.0	3.4	0	5	1.2	0	5	1.3	0	19.6	51	0	1	40	0	39	11.1	11
COAST & CENTRAL BAY																									
Oakland	8	0	0	0.0	6	0	4.0	3.5	2.6	0	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Richmond	--	--	--	--	--	--	--	--	--	--	--	--	--	5	1.6	0	--	--	--	--	--	--	--	--	--
San Francisco	9	0	0	0.0	6	0	4.7	2.9	2.2	0	6	1.7	0	8	1.4	0	22.5	52	0	1	46	0	41	9.9	11
San Pablo	11	0	1	0.0	7	0	5.2	3.2	1.8	0	6	1.3	0	5	1.6	0	21.2	64	0	1	--	--	--	--	--
EASTERN DISTRICT																									
Bethel Island	10	0	1	0.0	8	0	7.5	1.2	0.9	0	3	0.8	0	6	1.6	0	19.5	42	0	0	--	--	--	--	--
Concord	10	0	1	0.0	8	0	7.9	2.7	2.0	0	7	1.2	0	10	1.0	0	18.6	51	0	1	74	1	40*	10.7*	11*
Crockett	--	--	--	--	--	--	--	--	--	--	--	--	--	7	1.7	0	--	--	--	--	--	--	--	--	--
Fairfield	10	0	1	0.0	8	0	7.1	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Livermore	11	0	5	1.0	8	0	8.3	3.5	1.8	0	6	1.4	0	--	--	--	20.0	49	0	0	41	0	37	10.3	11
Martinez	--	--	--	--	--	--	--	--	--	--	--	--	--	7	1.5	0	--	--	--	--	--	--	--	--	--
Pittsburg	9	0	0	0.0	8	0	7.3	4.1	1.9	0	5	1.1	0	7	2.0	0	21.7	64	0	1	--	--	--	--	--
SOUTH CENTRAL BAY																									
Fremont	9	0	0	0.0	7	0	6.4	3.0	1.7	0	6	1.5	0	--	--	--	18.6	49	0	0	40	0	32	9.4	10
Hayward	9	0	0	0.0	7	0	6.2	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Redwood City	10	0	1	0.0	7	0	6.0	4.8	2.1	0	6	1.5	0	--	--	--	20.5	65	0	1	36	0	32	9.3	9
San Leandro	10	0	1	0.0	7	0	5.4	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
SANTA CLARA VALLEY																									
Gilroy	9	0	0	0.0	8	0	7.7	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Los Gatos	9	0	0	0.0	8	0	7.8	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
San Jose Central*	9	0	0	*	7	0	*	4.4	3.0	0	7	1.9	0	--	--	--	23.1	58	0	4	52	0	*	11.6	*
San Jose East	9	0	0	0.0	7	0	6.0	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
San Jose, Tully Road	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	26.0	65	0	3	45	0	35	10.4	10
San Martin	9	0	0	0.0	8	0	8.4	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Sunnyvale	10	0	1	0.0	8	0	6.9	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Total Bay Area Days over Standard		**0**	**7**			**0**				**0**			**0**			**0**			**0**	**7**		**1**			

(ppm) = parts per million, (pphm) = parts per hundred million, (ppb) = parts per billion

*

TABLE 3.4-3

Ten-Year Bay Area Air Quality Summary
Days over standards

YEAR	OZONE			CARBON MONOXIDE				NO_X	SULFUR DIOXIDE		PM10		PM2.5
	1-Hr		8-Hr	1-Hr		8-Hr		1-Hr	24-Hr		24-Hr*		24-Hr**
	Nat	Cal	Nat	Nat	Cal	Nat	Cal	Cal	Nat	Cal	Nat	Cal	Nat
1995	11	28	-	0	0	0	0	0	0	0	0	7	-
1996	8	34	-	0	0	0	0	0	0	0	0	3	-
1997	0	8	-	0	0	0	0	0	0	0	0	4	-
1998	8	29	16	0	0	0	0	0	0	0	0	5	-
1999	3	2	9	0	0	0	0	0	0	0	0	12	-
2000	3	12	4	0	0	0	0	0	0	0	0	7	1
2001	1	15	7	0	0	0	0	0	0	0	0	10	5
2002	2	16	7	0	0	0	0	0	0	0	0	6	5
2003	1	19	7	0	0	0	0	0	0	0	0	6	0
2004	0	7	0	0	0	0	0	0	0	0	0	7	1

* PM10 is sampled every sixth day – actual days over standard can be estimated to be six times the numbers listed.
** 2000 is the first full year for which the Air District measured PM2.5 levels.

Ozone

Ozone (O_3), a colorless gas with a sharp odor, is a highly reactive form of oxygen. High ozone concentrations exist naturally in the stratosphere. Some mixing of stratospheric ozone downward through the troposphere to the earth's surface does occur; however, the extent of ozone mixing is limited. At the earth's surface in sites remote from urban areas ozone concentrations are normally very low (0.03-0.05 ppm).

While ozone is beneficial in the stratosphere because it filters out skin-cancer-causing ultraviolet radiation, ground level ozone is harmful, is a highly reactive oxidant, which accounts for its damaging effects on human health, plants and materials at the earth's surface.

The BAAQMD began ozone monitoring in a few places in 1959. A large ozone monitoring network was established in 1965. The monitoring data in Figure 3.4-1 illustrates the improvement in air quality that has occurred during the past twenty years when measured by the decrease in the number of days the Bay Area exceeded the State one-hour ozone standard annually. This is also reflected in Table 3.4-3, which provides the number of days per year that the Bay Area exceeded the State and federal ozone standards. However, ozone concentrations in the BAAQMD still exceed the State one-hour ozone standard on occasion and the Bay Area is therefore designated as nonattainment for the State one-hour ozone standard.

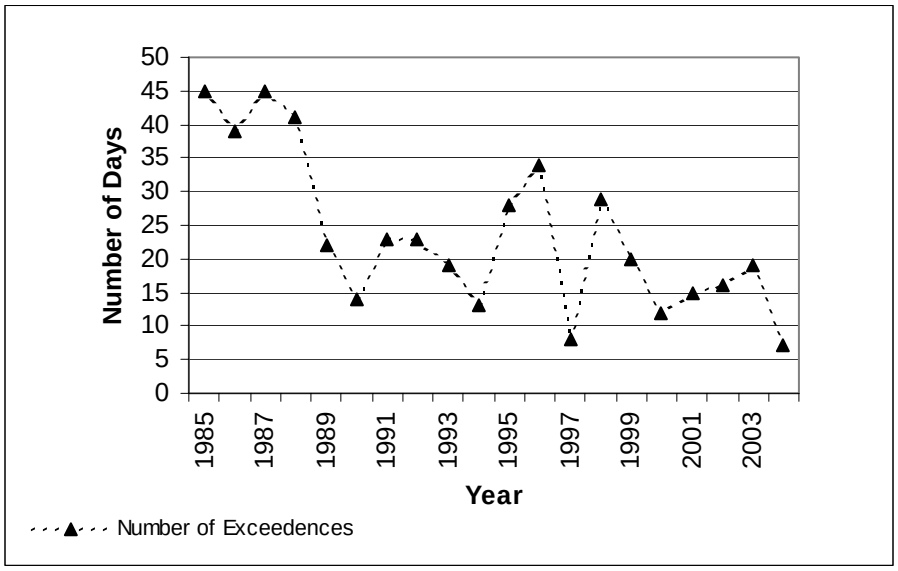

FIGURE 3.4-1
Exceedances of the State 1-hr Standard for Ozone in the Bay Area, 1985-2004

Ozone Precursors

NOx and VOC emissions are decreasing state-wide and in the San Francisco Bay Area since 1975 and are projected to continue declining through 2010 (CARB, 2004). Most NOx emissions are produced by the combustion of fuels. Mobile sources of NOx include motor vehicles, aircraft, trains, ships, recreation boats, industrial and construction equipment, farm equipment, off-road recreational vehicles, and other equipment. Stationary sources of NOx include both internal and external combustion processes in industries such as manufacturing, food processing, electric utilities, and petroleum refining. Area-wide sources, which include residential fuel combustion, waste burning, and fires, contribute only a small portion to the total NOx emissions. NO_2 is a component of NOx, and its presence in the atmosphere can be correlated with emissions on NOx.

VOC emissions result primarily from incomplete fuel combustion and the evaporation of paints, solvents and fuels. Mobile sources are the largest contributors to VOC emissions. Stationary sources include processes that use solvents (such as manufacturing, degreasing, and coating operations) and petroleum refining, and marketing. Area-wide VOC sources include consumer products, pesticides, aerosol and architectural coatings, asphalt paving and roofing, and other evaporative emissions.

NOx and VOC emissions have been reduced for both stationary and mobile sources. Stationary source emissions of VOC and NOx have been substantially reduced due to stringent District regulations. Mobile source emissions of VOC and NOx have been

substantially reduced because of stricter State and federal standards, despite an increase in vehicle miles traveled in the Bay Area.

Adverse Health Effects

The propensity of ozone for reacting with organic materials causes it to be damaging to living cells, and ambient ozone concentrations in the Bay Area are occasionally sufficient to cause health effects. Ozone enters the human body primarily through the respiratory tract and causes respiratory irritation and discomfort, makes breathing more difficult during exercise, reducing the respiratory system's ability to remove inhaled particles and fight infection while long-term exposure damages lung tissue. People with respiratory diseases, children, the elderly, and people who exercise heavily are more susceptible to the effects of ozone.

Plants are sensitive to ozone at concentrations well below the health-based standards and ozone is responsible for significant crop damage. Ozone is also responsible for damage to forests and other ecosystems.

3.4.1.1.2 Current Emissions Inventory

Emission inventories developed for the 2005 Ozone Strategy use 2000 as the base year. An emission inventory is a detailed estimate of air pollutant emissions from a range of sources in a given area, for a specified time period. Figure 3.4-2 presents the total ROG and NOx emissions for the base year inventory for 2000. Future projected emissions incorporate current levels of control on sources, growth in activity in the Air District and implementation of future programs that affect emissions of air pollutants.

There are literally millions of sources of ozone precursors in the Bay Area, including industrial and commercial facilities, motor vehicles, and consumer products such as household cleaners and paints. Even trees and plants produce ozone precursors. Sources of ozone precursors produced by human activity are called anthropogenic sources while natural sources, produced by plants and animals, are called biogenic sources. In the Bay Area, emissions from anthropogenic sources are much higher than from biogenic sources.

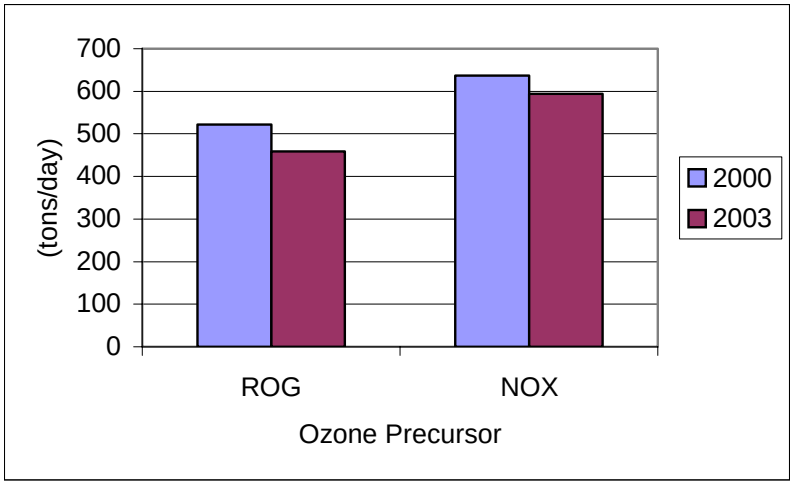

FIGURE 3.4-2
Ozone Precursor
Current Emissions Inventories (2000 & 2003)

The main sources of ROG are motor vehicles and evaporation of fuels, solvents and other petroleum products. NOx is produced mainly through combustion, and so the major sources are motor vehicles, off-road mobile sources and combustion at industrial and other facilities. Figures 3.4-3 and 3.4-4 show the major sources of ozone precursors in 2000.

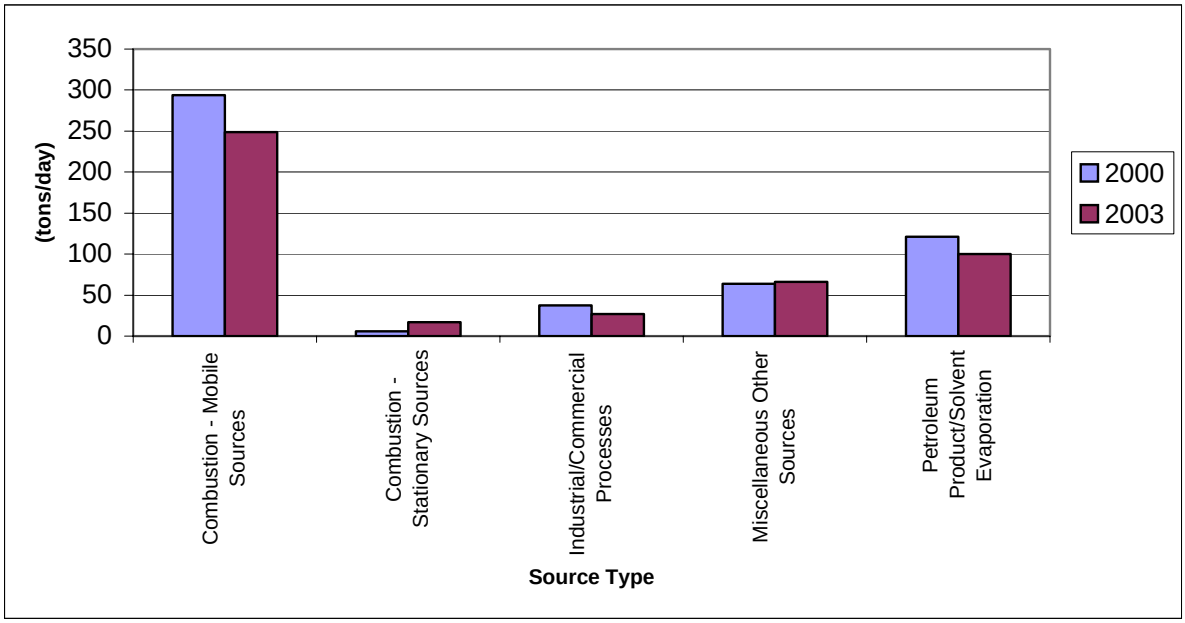

FIGURE 3.4-3
VOC Emission Inventories By Source Type

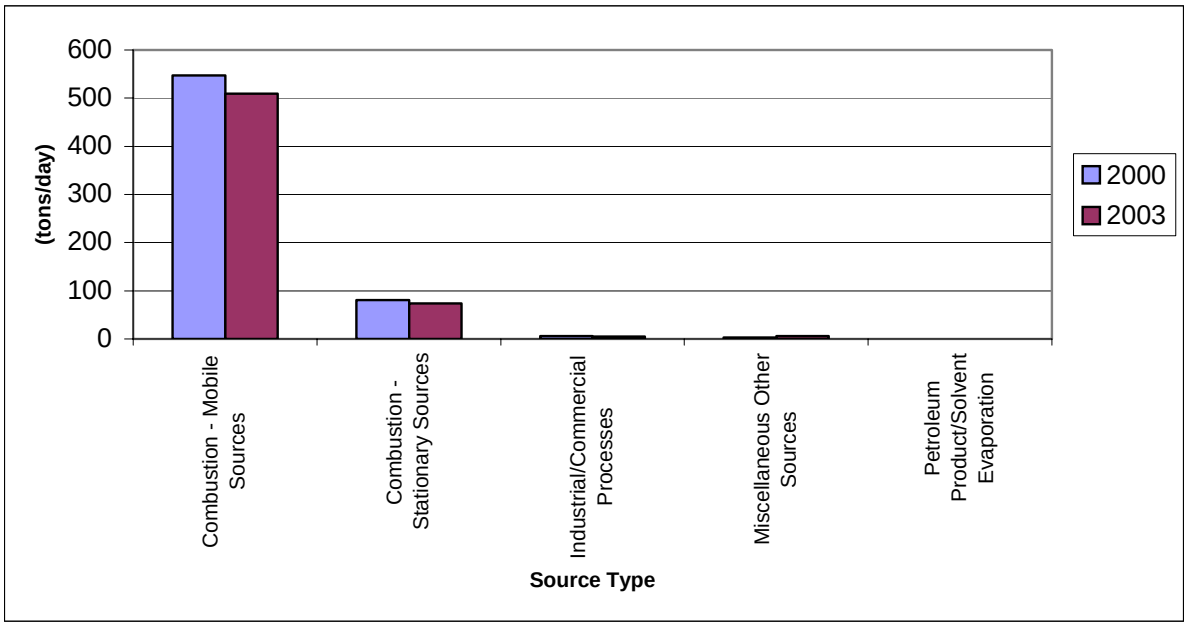

FIGURE 3.4-4
NOx Emission Inventories By Source Type

Table 3.4-4 presents the emission inventory for ozone precursors, ROG and NO_X, for the Bay Area in 2000 and 2003, and projections for 2005, 2010, and 2020. This inventory is referred to as a "planning inventory" because ozone levels are highest during the summer, and thus an estimate of typical summer emissions is needed for ozone planning purposes.

Anthropogenic sources can be broadly divided between stationary and mobile sources.

Stationary Sources

Stationary sources can be further divided between point and area sources.

Point Sources

Point sources are those that are identified on an individual facility or source basis, such as refineries and manufacturing plants. BAAQMD maintains a computer data bank with detailed information on operations and emissions characteristics for nearly 4,000 facilities, with roughly 20,000 different sources, throughout the Bay Area. Parameters that affect the quantities of emissions are updated regularly.

TABLE 3.4-4: Bay Area Baseline[1] Emission Inventory Projections: 2000 – 2020
Planning Inventory[2] (Tons/Day)[3]

SOURCE CATEGORY	Reactive Organic Gases 4					Oxides of Nitrogen 5				
	2000	2003	2005	2010	2020	2000	2003	2005	2010	2020
INDUSTRIAL/COMMERCIAL PROCESSES										
PETROLEUM REFINING FACILITIES										
Basic Refining Processes	0.7	0.6	0.6	0.7	0.8	0.4	0.3	0.4	0.4	0.4
Wastewater (Oil-Water) Separators	5.3	4.0	3.6	1.7	2.0	--	--	--	--	--
Wastewater Treatment Facilities	0.1	0.2	0.2	0.2	0.3	--	--	--	--	--
Cooling Towers	1.7	0.4	0.5	0.5	0.6	--	--	--	--	--
Flares & Blowdown Systems	13.1	5.2	1.6	1.6	1.6	2.5	0.8	0.4	0.4	0.4
Other Refining Processes	0.3	0.3	0.3	0.3	0.4	--	--	--	--	--
Fugitives	5.3	1.9	1.9	2.0	2.4	--	--	--	--	--
Subtotal	**26.5**	**12.6**	**8.7**	**7.1**	**7.9**	**3.0**	**1.2**	**0.8**	**0.8**	**0.9**
CHEMICAL MANUFACTURING FACILITIES										
Coating, Inks, Resins & Other Facilitie	0.7	0.6	0.6	0.6	0.7	0.1	0.1	0.1	0.1	0.1
Pharmaceuticals & Cosmetics	0.9	0.8	0.9	0.9	1.0	1.9	1.8	1.8	2.0	2.3
Fugitives - Valves & Flanges	0.7	0.7	0.7	0.8	0.9	--	--	--	--	--
Subtotal	**2.3**	**2.1**	**2.2**	**2.3**	**2.6**	**1.9**	**1.8**	**1.9**	**2.0**	**2.4**
OTHER INDUSTRIAL/COMMERCIAL PROCESSES										
Bakeries	1.0	0.9	1.0	1.0	1.2	--	--	--	--	--
Cooking	1.0	1.1	1.1	1.2	1.3	--	--	--	--	--
Wineries & Other Food & Agr. Processes	1.3	1.1	1.2	1.2	1.5	--	--	--	--	--
Metallurgical & Minerals Manufacturing	0.3	0.2	0.2	0.3	0.3	1.0	1.0	1.0	1.0	1.2
Waste Management	2.6	2.8	2.9	3.0	3.1	--	--	--	--	--
Semiconductor Manufacturing	0.7	0.7	0.7	0.8	0.9	--	--	--	--	--
Fiberglass Products Manufacturing	0.4	0.4	0.4	0.4	0.4	--	--	--	--	--
Rubber & Plastic Products Manufacturing	0.4	0.5	0.5	0.5	0.6	--	--	--	--	--
Contaminated Soil Aeration	1.1	0.2	0.1	0.1	0.1	--	--	--	--	--
Other Industrial Commercial	1.4	1.3	1.4	1.5	1.6	0.1	0.1	0.1	0.1	0.1
Subtotal	**10.2**	**9.2**	**9.3**	**9.9**	**10.9**	**1.1**	**1.1**	**1.1**	**1.2**	**1.3**
PETROLEUM PRODUCT/SOLVENT EVAPORATION										
PETROLEUM REFINERY EVAPORATION										
Storage Tanks	3.6	3.8	3.9	4.2	4.8	--	--	--	--	--
Loading Operations	1.3	0.1	0.1	0.1	0.1	--	--	--	--	--
Subtotal	**4.9**	**3.8**	**4.0**	**4.2**	**4.9**	**--**	**--**	**--**	**--**	**--**

TABLE 3.4-4 (continued)

SOURCE CATEGORY	Reactive Organic Gases 4					Oxides of Nitrogen 5				
	2000	2003	2005	2010	2020	2000	2003	2005	2010	2020
FUELS DISTRIBUTION										
Natural Gas Distribution	0.5	0.5	0.6	0.6	0.7	--	--	--	--	--
Bulk Plants & Terminals	1.8	1.8	1.9	1.9	2.0	--	--	--	--	--
Gasoline Transport (Trucks)	3.3	3.4	3.4	3.6	3.8	--	--	--	--	--
Gasoline Filling Stations	15.4	10.0	7.9	6.6	6.3	--	--	--	--	--
Aircraft Fueling	3.0	3.0	3.0	3.0	3.0	--	--	--	--	--
Recreational Boat Fueling	0.9	0.9	1.0	1.0	1.1	--	--	--	--	--
Portable Fuel Container Spillage	18.5	11.9	7.6	5.0	5.0	--	--	--	--	--
Other Fueling	0.3	0.3	0.4	0.4	0.4	--	--	--	--	--
Subtotal	**43.7**	**31.8**	**25.7**	**22.1**	**22.3**	**--**	**--**	**--**	**--**	**--**
OTHER ORGANIC COMPOUNDS EVAPORATION										
Cold Cleaning	5.5	4.3	4.2	4.5	5.0	--	--	--	--	--
Vapor Degreasing	0.3	0.2	0.2	0.2	0.1	--	--	--	--	--
Handwiping	5.0	3.1	1.8	1.9	2.1	--	--	--	--	--
Dry Cleaners	0.1	0.1	0.1	0.1	0.1	--	--	--	--	--
Printing	5.7	3.8	3.9	4.0	4.3	--	--	--	--	--
Adhesives & Sealants	8.9	8.7	8.9	9.3	9.4	--	--	--	--	--
Structures Coating	26.1	25.6	25.5	26.6	28.3	--	--	--	--	--
Industrial/Commercial Coating	16.1	13.9	13.7	14.7	16.4	--	--	--	--	--
Storage Tanks	1.3	1.0	0.9	1.0	1.1	--	--	--	--	--
Lightering & Ballsting	1.3	1.7	1.8	2.0	2.5	--	--	--	--	--
Other Organics Evaporation	2.5	2.4	2.5	2.7	3.0	--	--	--	--	--
Subtotal	**72.8**	**64.8**	**63.3**	**66.8**	**72.3**	**--**	**--**	**--**	**--**	**--**
COMBUSTION - STATIONARY SOURCES										
FUELS COMBUSTION										
Domestic	2.3	2.3	2.4	2.4	2.6	9.1	8.3	8.5	8.9	9.4
Cogeneration	0.9	1.0	1.0	1.1	1.2	4.3	5.0	5.2	5.4	6.0
Power Plants	0.5	0.2	0.3	0.2	0.2	14.1	2.8	2.8	2.7	3.0
Oil Refineries External Combustion	0.4	0.4	0.4	0.5	0.5	37.9	19.2	19.7	20.9	23.8
Glass Melting Furnaces - Natural Gas	--	--	--	--	--	2.9	2.2	2.3	2.4	2.8
Reciprocating Engines	0.8	0.8	0.7	0.6	0.4	8.1	7.9	7.1	6.4	5.2
Turbines	0.1	0.1	0.1	0.1	0.1	1.6	1.7	1.7	1.8	2.0
Combustion at Landfills/Misc. Ext. Comb	1.1	1.0	1.0	1.1	1.2	17.2	17.6	18.0	19.1	21.1
Subtotal	**6.2**	**5.8**	**5.9**	**5.9**	**6.2**	**95.2**	**64.6**	**65.2**	**67.6**	**73.3**

TABLE 3.4-4 (continued)

SOURCE CATEGORY	Reactive Organic Gases *4*					Oxides of Nitrogen *5*				
	2000	**2003**	**2005**	**2010**	**2020**	**2000**	**2003**	**2005**	**2010**	**2020**
BURNING OF WASTE MATERIAL										
Incineration	0.1	0.1	0.1	0.1	0.1	0.3	0.4	0.4	0.4	0.4
Planned Fires	0.1	0.1	0.1	0.1	0.1	--	--	--	--	--
Subtotal	**0.2**	**0.2**	**0.2**	**0.2**	**0.2**	**0.4**	**0.4**	**0.4**	**0.4**	**0.4**
Banked Emissions 6	**0.0**	**11.2**	**11.2**	**11.2**	**11.2**	**0.0**	**8.1**	**8.1**	**8.1**	**8.1**
Alternative Compliance Allowance 7	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**3.5**	**7.2**	**4.3**	**4.3**
Subtotal (District Jurisdiction)	**166.7**	**141.6**	**130.4**	**129.7**	**138.5**	**101.5**	**80.6**	**84.6**	**84.4**	**90.6**
COMBUSTION - MOBILE SOURCES										
ON-ROAD MOTOR VEHICLES										
Passenger Cars	112.6	91.2	72.1	42.1	20.2	97.6	80.6	62.0	34.4	13.5
Light Duty Trucks<6000lbs	51.2	44.7	38.6	28.1	17.9	66.3	56.7	45.5	28.6	14.0
Medium Duty Trucks 6001-8500 lbs	14.5	12.5	10.9	8.9	6.5	24.3	21.0	17.5	12.5	6.5
Light Heavy Duty Trucks 8501-14000lbs	7.4	4.9	3.9	2.8	2.4	9.2	9.3	9.0	7.3	4.4
Medium Heavy Duty Trucks 14001-33000lbs	5.9	5.1	4.6	3.3	1.9	34.1	33.4	31.4	22.5	9.0
Heavy Heavy Duty Trucks>33000 lbs	7.0	6.6	6.1	4.3	2.4	97.6	92.0	86.9	58.0	21.9
School/Urban Buses	2.2	2.2	2.2	2.1	2.0	21.5	21.1	20.2	20.1	17.1
Motor-Homes	1.1	1.0	0.8	0.6	0.2	2.5	2.3	2.0	1.9	1.3
Motorcycles	5.6	4.5	3.9	2.7	1.6	1.0	0.9	0.9	0.7	0.5
Subtotal	**207.5**	**172.6**	**142.9**	**94.8**	**55.1**	**354.1**	**317.3**	**275.4**	**185.9**	**88.1**
OFF-HIGHWAY MOBILE SOURCES										
Lawn and Garden Equipment	31.7	25.1	20.6	15.5	13.6	2.8	3.0	3.1	1.9	1.3
Transportation Refrigeration Units	0.9	0.9	0.8	0.7	0.4	4.5	4.6	4.1	3.5	2.3
Agricultural Equipment	1.3	1.2	1.1	0.8	0.4	9.2	8.3	7.7	6.1	3.5
Construction and Mining Equipment	10.6	10.7	9.1	6.4	4.5	91.7	91.1	81.8	62.9	43.1
Industrial Equipment	3.2	3.3	2.8	1.6	1.0	20.6	20.2	16.7	10.8	7.8
Light Duty Commercial Equipment	6.6	6.6	5.6	4.4	3.6	10.8	10.9	10.0	9.1	7.8
Trains	0.6	0.7	0.7	0.6	0.6	14.9	13.1	11.3	9.7	9.5
Off Road Recreational Vehicles	0.8	0.3	0.2	0.2	0.1	0.1	0.1	0.1	0.1	0.1
Ships	0.6	0.6	0.6	0.7	0.8	10.5	10.0	10.4	11.4	13.7
Commercial Boats	0.7	0.8	0.8	0.9	1.1	5.8	6.2	6.3	6.7	7.3
Recreational Boats	22.0	19.5	17.0	12.1	7.1	3.3	4.1	4.8	5.0	4.4
Subtotal	**79.1**	**69.5**	**59.2**	**43.7**	**33.2**	**174.3**	**171.5**	**156.3**	**127.1**	**100.7**

TABLE 3.4-4 (concluded)

SOURCE CATEGORY	Reactive Organic Gases 4					Oxides of Nitrogen 5				
	2000	2003	2005	2010	2020	2000	2003	2005	2010	2020
AIRCRAFT										
Commercial Aircraft	2.9	2.1	2.4	3.1	4.8	14.4	13.9	15.9	20.8	25.8
General Aviation	0.9	0.8	0.8	0.9	0.9	0.3	0.3	0.4	0.5	0.6
Military Aircraft	4.2	3.4	3.4	3.5	3.5	4.8	4.9	4.9	5.0	5.1
Airport Ground Support Equipment	0.4	0.4	0.4	0.4	0.5	2.3	2.6	2.7	2.9	3.2
Subtotal	**8.3**	**6.7**	**7.0**	**7.8**	**9.8**	**21.8**	**21.8**	**23.9**	**29.2**	**34.7**
MISCELLANEOUS OTHER SOURCES										
Construction Operations	--	--	--	--	--	--	--	--	--	--
Farming Operations	--	--	--	--	--	--	--	--	--	--
Entrained Road Dust-Paved Roads	--	--	--	--	--	--	--	--	--	--
Entrained Road Dust-Unpaved Roads	--	--	--	--	--	--	--	--	--	--
Wind Blown Dust	--	--	--	--	--	--	--	--	--	--
Animal Waste	5.5	5.5	5.5	5.5	5.5	--	--	--	--	--
Agricultural Pesticides	1.1	1.3	1.2	1.1	1.1	--	--	--	--	--
Non-Agricultural Pesticides	0.3	0.2	0.2	0.2	0.2	--	--	--	--	--
Consumer Products(Excluding Pesticides)	52.2	49.1	46.9	48.9	51.9	--	--	--	--	--
Other Sources	4.9	10.7	6.8	6.8	6.9	2.7	5.9	3.8	3.8	3.8
Subtotal	**63.9**	**66.7**	**60.6**	**62.5**	**65.6**	**2.7**	**5.9**	**3.8**	**3.8**	**3.8**
GRAND TOTAL EMISSIONS	**526**	**457**	**400**	**338**	**302**	**654**	**597**	**544**	**430**	**318**

1 Inventory and projections assume implementation of all control measures adopted as of December 31, 2003, including Smog Check II for the Bay Area.

2 The planning inventory represents average summer day emissions. ABAG Projections 2003 were used to project future emissions from on-road motor vehicles. ABAG Projections 2002 was the regional population projections used for the remainder of the planning inventory.

3 Entries are rounded to nearest whole number, totals may not equal to sums of column entries.

4 Photochemically reactive organic compounds excludes methane and other non-reactives and roughly 200 tpd of ROG emissions from natural sources.

5 Oxides of nitrogen (nitric oxide and/or nitrogen dioxide), NOx as NO2.

6 Banked Emissions show the total current deposits in the District's emissions banking program as allowed by BAAQMD Regulation 2, Rules 2 and 4. These emissions were reduced (beyond regulations) and banked, but may be withdrawn from the bank and emitted in future years.

7 Surplus emissions, voluntarily reduced, available for alternative compliance with BARCT requirements of selected rules, as prescribed by State law and BAAQMD Regulation 2, Rule 9.

Area Sources

Area sources are stationary sources that are individually very small, but that collectively make a large contribution to the inventory. Many area sources do not require permits from the BAAQMD, such as residential heating, and the wide range of consumer products such as paints, solvents, and cleaners. Some facilities considered to be area sources do require permits from the BAAQMD, such as gas stations and dry cleaners. Emissions estimates for area sources may be based on the BAAQMD data bank, calculated by CARB using statewide data, or calculated based on surrogate variables.

Mobile Sources

Mobile sources include on-road motor vehicles such as automobiles, trucks and buses, as well as off-road sources such as construction equipment, boats, trains and aircraft. Estimates of on-road motor vehicle emissions include consideration of the fleet mix (vehicle type, model year, and accumulated mileage), miles traveled, ambient temperatures, vehicle speeds, and vehicle emission factors, as developed from comprehensive CARB testing programs. The BAAQMD also receives vehicle registration data from the Department of Motor Vehicles. Some of these variables change from year to year, and the projections are based upon expected changes. Emissions from off-road mobile sources are calculated using various emission factors and methodologies provided by CARB and U.S. EPA.

3.4.1.3 Non-Criteria Pollutants

Although the primary mandate of the BAAQMD is attaining and maintaining the national and State Ambient Air Quality Standards for criteria pollutants within the BAAQMD jurisdiction, the BAAQMD also has a general responsibility to control, and where possible, reduce public exposure to airborne toxic compounds. The State and federal government have set health-based ambient air quality standards for criteria pollutants. The air toxics program was established as a separate and complementary program designed to evaluate and reduce adverse health effects resulting from exposure to toxic air contaminants (TACs).

The BAAQMD works to understand and to control both locally elevated concentrations (i.e., "hot spots") and ambient background concentrations of TACs. The major elements of the Air District's air toxics program are outlined below.

- Preconstruction review of new and modified sources for potential health impacts, and the requirement for new/modified sources with non-trivial TAC emissions to use the Best Available Control Technology.

- The Air Toxics Hot Spots Program, designed to identify industrial and commercial facilities that may result in locally elevated ambient concentrations of toxic air contaminants, to report significant emissions to the affected public, and to reduce unacceptable health risks.

- Control measures designed to reduce emissions from source categories of TACs, including rules originating from the State Toxic Air Contaminant Act and the federal Clean Air Act.

- The toxic air contaminant emissions inventory, a database that contains information concerning routine and predictable emissions of TACs from permitted stationary sources.

- Ambient monitoring of toxic air contaminant concentrations at a number of sites throughout the Bay Area.

Air Toxics Emission Inventory

The BAAQMD maintains a database that contains information concerning emissions of TACs from permitted stationary sources in the Bay Area. This inventory, and a similar inventory for mobile and area sources compiled by CARB, is used to plan strategies to reduce public exposure to TACs. The detailed concentrations of various TACs are reported in the BAAQMD, Toxic Air Contaminant Control Program, 2003 Annual Report (BAAQMD, 2005) and summarized in Table 3.4-5. The 2002 TAC data shows decreasing concentrations of many TACs in the Bay Area. The most dramatic emission reductions in recent years have been for certain chlorinated compounds that are used as solvents including 1,1,1-trichloroethane, methylene chloride, and perchloroethylene. Table 3.4-5 contains a summary of average ambient concentrations of TACs measured at monitoring stations in the Bay Area by the District in 2002.

Health Effects

The primary health risk of concern due to exposure to TACs is the risk of contracting cancer. The carcinogenic potential of TACs is a particular public health concern because many scientists currently believe that there are not "safe" levels of exposure to carcinogens without some risk to causing cancer. The proportion of cancer deaths attributable to air pollution has not been estimated using epidemiological methods. CARB has estimated the average potential cancer risk from outdoor ambient levels of air toxics for 2000. Based on the evaluation by CARB Diesel exhaust PM10 contributes 71 percent to the total cancer risk (see Table 3.4-6).

TABLE 3.4-5
Concentration of Toxic Air Contaminants in the Bay Area (2002)

Monitoring Station (mean ppb*)	Chemical[(1)]											
	BENZ	**CCl_4**	**$CHCl_3$**	**DCM**	**EDB**	**EDC**	**MTBE**	**PERC**	**TCA**	**TCE**	**TOL**	**VC**
Oakland – Davie Stadium	0.44	0.11	0.01	0.29	0.01	0.05	0.21	0.03	0.03	0.03	0.94	0.15
San Leandro	0.28	0.11	0.08	0.28	0.01	0.05	0.32	0.02	0.03	0.03	0.89	0.15
Livermore – Rincon Ave	0.39	0.11	0.02	0.27	0.01	0.05	0.46	0.02	0.31	0.03	0.90	0.15
Oakland – Filbert Street	0.50	0.11	0.02	0.34	0.01	0.05	0.46	0.05	0.03	0.03	1.33	0.15
Pittsburg – W 10th St.	0.38	0.11	0.02	0.49	0.01	0.05	0.80	0.02	0.03	0.03	1.27	0.15
Martinez	0.33	0.11	0.01	0.30	0.01	0.05	0.65	0.01	0.09	0.03	0.79	0.15
Crockett	0.20	0.11	0.02	0.74	0.01	0.05	0.38	0.01	0.05	0.03	0.36	0.15
Concord – Treat Blvd.	0.43	0.12	0.03	0.25	0.01	0.05	0.56	0.03	0.03	0.03	1.79	0.15
Richmond – 7th St	0.35	0.11	0.02	0.30	0.01	0.05	0.53	0.02	0.03	0.03	1.21	0.15
Bethel Island	0.24	0.11	0.01	0.27	0.01	0.05	0.43	0.01	0.03	0.03	0.50	0.15
San Pablo – Rumrill Blvd	0.38	0.11	0.02	0.34	0.01	0.05	0.63	0.03	0.03	0.03	1.04	0.15
San Rafael	0.38	0.10	0.02	0.26	0.01	0.05	0.37	0.08	0.03	0.03	0.84	0.15
Fort Cronkite – Sausalito	0.14	0.11	0.01	0.25	0.01	0.05	0.24	0.01	0.06	0.03	0.27	0.15
Napa – Jefferson St	0.48	0.11	0.03	0.25	0.01	0.05	0.82	0.02	0.03	0.03	1.08	0.15
San Francisco – Arkansas St	0.40	0.11	0.02	0.49	0.01	0.05	0.37	0.03	0.10	0.03	1.04	0.15
Redwood City	0.53	0.11	0.04	0.29	0.01	0.05	0.68	0.04	0.03	0.09	1.72	0.15
Sunnyvale	0.40	0.10	0.03	0.31	0.01	0.05	0.39	0.03	0.03	0.03	0.80	0.15
San Jose – Jackson Street	0.59	0.11	0.02	0.37	0.01	0.05	0.73	0.03	0.03	0.03	1.54	0.15
Vallejo – Tuolumne St	0.52	0.11	0.02	0.62	0.01	0.05	0.84	0.02	0.03	0.03	1.18	0.15
Santa Rosa – 5th St	0.41	0.11	0.02	0.30	0.01	0.05	0.45	0.01	0.66	0.03	0.97	0.15

(1) BENZ = benzene, CCl_4 = carbon tetrachloride, $CHCl_3$ = chloroform, DCM = methylene chloride, EDB = ethylene dibromide, EDC = ethylene dichloride, MTBE = methyl tertiary butyl ether, PERC = perchloroethylene, TCA = 1,1,1-trichloroethane, TCE = trichloroethylene, TOL = toluene, and VC = vinyl chloride.
Source: BAAQMD, 2005.
*Values below the detection limit are set to one-half the detection limit for statistical calculations

TABLE 3.4-6

Estimated Statewide Average Potential Cancer Risk From Outdoor Ambient Levels of Air Toxics For 2000[1]

Compound	Potential Cancer Risk[2,3] Excess Cancers/Million	Percent Contribution to Total Risk
Diesel Exhaust PM10	540	71.2
1,3-Butadiene	74	9.8
Benzene	57	7.5
Carbon Tetrachloride	30	4.0
Formaldehyde	19	2.5
Hexavalent Chromium	17	2.2
para-Dichlorobenzene	9	1.2
Acetaldehyde	5	0.7
Perchloroethylene	5	0.7
Methylene Chloride	2	0.1
TOTAL	758	100

(1) CARB, 2000
(2) Diesel exhaust PM10 potential cancer risk based on 2000 emission inventory estimates. All other potential cancer risks based on air toxics network data. 1997 monitoring data were used for para-dichlorobenzene. 1998 monitoring data was used for all other pollutants.
(3) Assumes measured concentrations are equivalent to annual average concentrations and duration of exposure is 70 years, inhalation pathway only.

3.4.1.4 Transport of Air Pollutants

Since 1989, CARB has evaluated the impacts of the transport of ozone and ozone precursor emissions from upwind areas to the ozone concentration in downwind areas. These analyses demonstrate that the air basin boundaries are not true boundaries of air masses. All urban areas are upwind contributors to their downwind neighbors.

The Bay Area is both a contributor and a receptor for ozone and ozone precursor transport. Ozone precursors emitted in the Bay Area are transported into northern California, including the San Joaquin Valley, the Sacramento Valley, the Mountain Counties, and the coastal areas from Sonoma County to San Luis Obispo County (see Figure 3.4-5). The Bay Area is a receptor area for ozone and ozone precursors transported from the broader Sacramento area (CARB, 2001) (see Figure 3.4-5).

The Bay Area is bounded to the west by the Pacific Ocean and the Bay. Mountains surround the Bay Area to the north, east and south. On many summer days a sea breeze pushes relatively clean air from the Pacific Ocean toward the east, where air flows predominantly through passes in the surrounding mountains. As it moves from west to east the sea breeze flow picks up pollutants from the central Bay Area and transports the mix of clean coastal air and pollutants to surrounding regions. On some summer days,

however, a high-pressure zone sets up over Central California and can block the sea breeze. On such days, air from the Central Valley can flow from east to west. These days can also produce high ozone in the Bay Area and the Central Valley.

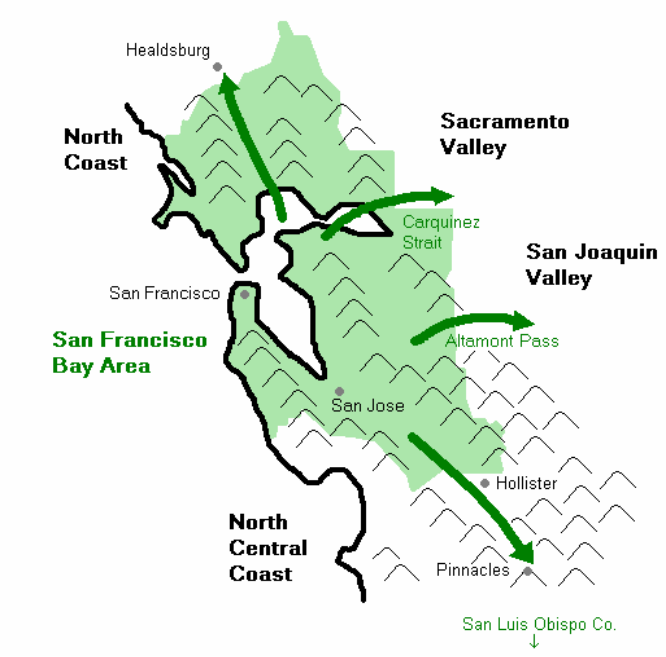

FIGURE 3.4-5
Ozone Transport from the BAAQMD

At the Altamont Pass, electricity-generating windmills lining the hill crests attest to the strong, steady winds blowing eastward into the San Joaquin Valley. Areas in the path of these natural inland air currents, such as Vacaville in the Sacramento Valley, and Tracy in the San Joaquin Valley, may be influenced by pollutants transported from the Bay Area. Areas further downwind, such as the cities of Sacramento and Stockton, may also be impacted by transport from the Bay Area, but to a lesser degree (CARB, 2001). The degree to which emissions from the Bay Area contribute to exceedances of ozone standards in neighboring air districts is under investigation and has not yet been quantified.

On some days when the State standard is violated in the Sacramento area, pollutants from the Bay Area are carried in by the delta breeze. However, on hot summer days when the temperature in Sacramento climbs into the high 90's and above, stagnant wind conditions allow a buildup of local emissions, and the ozone concentration can violate the State or federal standards. Only when a strong evening delta breeze disperses these accumulated pollutants do the ozone concentrations decrease (CARB, 2001).

On some days, pollutants transported from the Bay Area may impact the northern San Joaquin Valley, possibly mixing with local emissions to contribute to State and federal violations at Stockton and Modesto. On other days, violations of the State standard may

be due entirely to local emissions. The impact of Bay Area transport diminishes with distances, so metropolitan areas such as Fresno and Bakersfield to the south are less affected. In those areas, ozone concentrations are dominated by local emissions (CARB, 2001).

To the south, winds funnel pollutants into the Santa Clara Valley. Surface winds can carry these pollutants southeast to Hollister in the North Central Coast Air Basin. Ozone violations in Hollister may largely be caused by this transport, with transport aloft from the northern San Joaquin Valley occasionally making a shared contribution. Winds can also carry pollutants over the hills south of Hollister, as far as northern San Luis Obispo County (CARB, 2001).

In Sonoma County, summer prevailing winds blow across the Sonoma Plain from the southern portion of Sonoma County, which lies within the Bay Area Air Basin, to the northern part, which lies within the North Coast Air Basin. The Bay Area portion of Sonoma County, comprising the urban areas of Santa Rosa and Petaluma, is a substantial source of ozone precursor emissions. High ozone concentrations at Healdsburg, in the North Coast, are entirely due to emissions transported from the Bay Area (CARB, 2001).

3.4.2 SIGNIFICANCE CRITERIA

To determine whether or not air quality impacts from the proposed project are significant, impacts will be evaluated and compared to the significance criteria in Table 3.4-7. If impacts equal or exceed any of the following criteria, they will be considered significant.

TABLE 3.4-7

Air Quality Significance Thresholds for Project Operations

Significance Thresholds for Localized Impacts	
Pollutant	**Significance Threshold**
PM10	80 lbs/day or 15 tons/yr
CO	Project plus background >20 ppm (1-hour average) Project plus background > 9 ppm (8-hour average)
Diesel Particulate Emissions and other Toxic Air Contaminants (TACs)	Maximum Exposed Individual (MEI) Cancer Risk $\geq$ 10 in 1 million Hazard Index $\geq$ 1.0 at the MEI
Significance Thresholds for Regional Impacts	
Pollutant	**Significance Threshold**
ROG	2005 Ozone Strategy results in a net increase in emissions
NOx	2005 Ozone Strategy results in a net increase in emissions
PM10	2005 Ozone Strategy results in a net increase in emissions

3.4.3 ENVIRONMENTAL IMPACTS

The purpose of the 2005 Ozone Strategy is to establish a comprehensive program to attain the State one-hour ozone standard through implementation of different categories of control measures. Implementation of the control measures contained in the 2005 Ozone Strategy is required to make progress toward meeting the State ozone standard.

This subchapter evaluates secondary air pollutant emissions that could occur as a consequence of efforts to reduce ozone (e.g., emissions from control equipment such as afterburners). Secondary air quality impacts are potential increases in air pollutants that occur indirectly from implementation of control measures in the 2005 Ozone Strategy. Table 3.4-8 lists the control measures with potential secondary air quality impacts.

3.4.3.1 Criteria Pollutants

As identified in Table 3.4-8, potential secondary air quality impacts evaluated in this section are associated with: (1) change in the use of VOCs; (2) emissions from new control equipment installed at stationary sources; (3) potential impacts of NOx controls and ozone transport; (4) construction activities; (5) increased electricity demand; (6) emissions from mobile sources; and (7) miscellaneous air quality issues.

Secondary Emissions from Change in Use of Lower VOC Coatings

PROJECT-SPECIFIC IMPACTS: Some of the proposed control measures are expected to alter the formulation of various coating products including SS 1 - Auto Refinishing, SS 2 - Graphic Arts Operations, SS 3 – High Emitting Spray Booths, SS 4 – Polyester Resin Operations, and SS 5 – Wood Products. To obtain further VOC emission reductions from paints and other coating products it is expected that coatings would be reformulated with water-based or exempt compound formulations. Concerns have been raised regarding a number of issues associated with the use of lower VOC content limits for coating products including: (1) low VOC coatings tend to have a high solids content resulting in a thicker application and use of more low VOC coatings than conventional coatings; (2) the potential for illegal thinning producing non-compliant coatings; (3) the potential need for more priming to promote adhesion; (4) the potential need for more topcoats to increase durability; (5) the potential need for more touch-ups and repair work since low VOC coatings dry slowly and are susceptible to damage; (6) the potential need for more frequent recoating due to inferior durability when compared to conventional coatings; (7) substituting low VOC coatings with inferior durability with better performing high VOC in other categories (e.g., the use of industrial maintenance coatings in residential settings); and (8) the potential for low VOC coatings to have higher reactivity rates (thus producing more ozone) than conventional coatings.

TABLE 3.4-8

Control Measures with Potential Secondary Air Quality Impacts

Control Measures	Control Measure Description	Control Methodology	Air Quality Impact
SS 1	Auto Refinishing	Reformulated low-VOC coatings/solvents	Potential change in use of VOC and toxic contaminants
SS 2	Graphic Arts Operations	Reformulated low-VOC coatings/solvents	Potential change in use of VOC and toxic contaminants
SS 3	High Emitting Spray Booths	Reformulated low-VOC coatings/solvents, add on control devices	Potential change in use of VOC and toxic contaminants, potential increase in combustion emissions
SS 4	Polyester Resin Operations	Reformulated low-VOC coatings/solvents	Potential change in use of VOC and toxic contaminants
SS 5	Wood Products Coating	Reformulated low-VOC coatings/solvents	Potential change in use of VOC and toxic contaminants
SS 6	Flares	Most likely through control of operations but could include incineration	Potential combustion emissions
SS 7	Gasoline Bulk Terminals and Plants	More stringent standards, emission controls (e.g., flares)	Potential combustion emissions
SS 8	Marine Loading Operations	Add-on control equipment	Potential increase in combustion emissions
SS 9	Organic Liquid Storage Tanks	Add domes to tanks, improved standards for tank cleaning, I&M programs	Potential increase in construction emissions
SS 10	Pressure Relief Devices	Add-on control equipment	Potential increase in combustion emissions
SS 12	Industrial, Institutional and Commercial Boilers	Low NOx burners	Increase in localized ozone levels, reduced boiler efficiency
SS 13	Large Water Heaters and Small Boilers	Low NOx burners, lower standards for new heaters/ boilers	Increase in localized ozone levels, reduced boiler efficiency
SS 14	Stationary Gas Turbines	Add-on control equipment, including SCR	Increase in localized ozone levels, reduced boiler efficiency, increased ammonia emissions
MS 3	Low-Emission Vehicle Incentives	Purchase low or zero-emission vehicles or engines, engine repowers, retrofits & replacements; add-on control equipment; clean fuels or additives; and use of alternative fuels	Electricity generation to operate equipment, potential decrease in engine efficiency could reduce fuel economy and increase emissions, production of cleaner fuels could increase emissions at refineries.

TABLE 3.4-8 (concluded)

Control Measures	Control Measure Description	Control Methodology	Air Quality Impact
TCM 1	Support Voluntary Employer-Based Trip Reduction Programs	Support and encourage voluntary efforts by Bay Area employers to promote the use of commute alternatives by their employees	Localized increase in emissions due to increased traffic in areas near transit stations
TCM 3	Improve Local and Areawide Bus Service	Add on control devices (particulate traps and NOx catalysts), alternative clean fuels and bus service improvements	Localized increase in emissions due to increased traffic near bus transit stations
TCM 4	Upgrade and Expand Local and Regional Rail Service	Construction of additional rail facilities, electrification of rail services	Construction emissions, electricity generation to operate equipment, localized increase in emissions due to increased traffic near rail stations
TCM 5	Improve Access to Rails and Ferries	Construction of new facilities, use of low emission vehicles	Construction emissions, electricity generation to operate equipment, localized increase in emissions due to increased traffic near transit stations
TCM 6	Improve Interregional Rail Service	Construction of new rail facilities	Construction emissions, localized increase in emissions due to increased traffic near rail stations
TCM 7	Improve Ferry Service	Construction of new facilities, use of low emission ferries, and add-on controls	Construction emissions, localized increase in emissions due to increased traffic near ferry terminals
TCM 8	Construct Carpool/Express Bus Lanes on Freeways	Construction of new High Occ-upancy Vehicle (HOV) lanes	Construction emissions
TCM 9	Improve Bicycle Access and Facilities	Construction of additional bicycle lanes	Construction emissions are expected to be minor
TCM 13	Transit Use Incentives	Increase transit use and lower vehicle emissions with incentives including better transit information, universal fare cards, and better signage	Localized increase in emissions due to increased traffic near transit stations

These issues have been studied by CARB, the SCAQMD, and the U.S. EPA as part of rule making activities. In all studies, the low VOC coatings were determined to perform comparably to the conventional coatings. These issues are further discussed below.

More Thickness: Reformulated compliant water- and solvent-borne coatings are very viscous (i.e., are formulated using a high-solids content) and, therefore, may be difficult to handle during application, tending to produce a thick film when applied directly from the can. A thicker film might indicate that a smaller surface area is covered with a given amount of material, thereby increasing VOC emissions per unit of area covered.

Table 3.4-9 shows that the 1998 CARB Survey yielded results for average VOC content as the random sampling of low-VOC coatings to their conventional counterparts. The survey showed a consistent trend of a sales-weighted average lower-percent solids by volume in coatings with lower-VOC content.

Based upon the results of the CARB survey, it is concluded that compliant low-VOC coatings are not necessarily formulated with higher solids content than conventional coatings (CARB, 2000). Further, there is no evidence that there is an inverse correlation between solids content and coverage area. Studies completed by the SCAQMD show similar results (SCAQMD, 2003).

TABLE 3.4-9

1998 CARB Survey

	CARB SURVEY RESULTS	
Coating Types	**Average VOC Content (g/l)[1]**	**Average Solids by Volume (%)**
Floor Coatings (>250 g/l)	149	83
Floor Coatings (<250 g/l)	164	34
IM[2] Coatings (>250 g/l)	436	56
IM Coatings (<250 g/l)	124	36.6
Nonflats (>250 g/l)	331	58
Nonflats (<250 g/l)	164	36
Quick Dry Enamels (>250 g/l)	403	50
Quick Dry Enamels (<250 g/l)	n/a	n/a
PSU[3] (>250 g/l)	384	46
PSU (<250 g/l)	101	31
Quick Dry PSU (>250 g/l)	432	45
Quick Dry PSU (>250 g/l)	136	41
Water Proofing Sealer (>250 g/l)	339	50
Water Proofing Sealer (<250 g/l)	227	30
Rust Preventive Coatings (>250 g/l)	382	48
Rust Preventive Coatings (<250 g/l)	144	39
Stains(>250 g/l)	412	47
Stains(<250 g/l)	203	30

(1) g/l = grams per liter
(2) Industrial/Maintenance
(3) PSU = primers, sealers, and undercoatings

Illegal Thinning: It has been asserted that thinning occurs in the field in excess of what may be allowed by rule limits. It has also been asserted that, because reformulated compliant water- and solvent-borne coatings are more viscous (i.e., high-solids content), painters have to adjust the properties of the coatings to make them easier to handle and apply. In particular for solvent-borne coatings, this adjustment consists of thinning the coating as supplied by the manufacturer by adding solvent to reduce its viscosity. The added solvent increases VOC emissions back to or sometimes above the level of higher VOC formulations.

Many of the reformulated compliant coatings are water-borne formulations or will utilize exempt solvents, thereby eliminating any concerns of thinning the coating as supplied and increasing the VOC content as applied beyond the compliance limit. Since exempted solvents are not considered a reactive VOC, thinning with them would, therefore, not increase VOC emissions. Water based coatings are thinned with water and would also not result in increased VOC emissions.

In mid-1991, CARB conducted a field study of thinning in regions of California that have established VOC limits for architectural coatings. A total of 85 sites where painting was in progress were investigated. A total of 121 coatings were in use at these sites, of which 52 were specialty coatings. The overall result of this study was that only six percent of the coatings were thinned in excess of the required VOC limit indicating a 94 percent compliance rate (CARB, 2000). The SCAQMD has completed similar studies concluding that illegal thinning was not a major problem (SCAQMD, 2003).

In summary, field investigations of actual painting sites in California that have VOC limits for coatings indicate that thinning of specialty coatings exists but rarely beyond the actual compliance limits. Even in cases where thinning does occur, it is rarer still for paints to be thinned to levels that would exceed applicable VOC content limits. The conclusion is that widespread thinning does not occur often; when it does occur, it is unlikely to occur at a level that would lead to a substantial emissions increase when compared with emissions from higher VOC coatings. As a result, claims of thinning resulting in significant adverse air quality impacts are unfounded.

More Priming: Conventional coatings are currently used as part of a three, four, or five part coating system, consisting of one or more of the following components; primer, midcoat, and topcoat. Coating manufacturers and coating contractors have asserted that reformulated compliant low-VOC water- and solvent-borne topcoats do not adhere as well as higher-VOC solvent-borne topcoats to unprimed substrates. Therefore, the substrates must be primed with typical solvent-borne primers to enhance the adherence quality. Additionally, it is has been asserted that water-borne sealers do not penetrate and seal porous substrates like wood, as well as traditional solvent-borne sealers. This allegedly results in three or four coats of the sealer per application, compared to one coat for a solvent-borne sealer that would be necessary, resulting in an overall increase in VOC emissions for the coating system.

Regarding surface preparation, coating product data sheets were evaluated. Information from the coating product data sheets indicated that low-VOC coatings do not require

substantially different surface preparation than conventional coatings. According to the product data sheets, conventional and low-VOC coatings require similar measures for preparation of the surface (i.e. apply to clean, dry surfaces), and application of the coatings (i.e. brush, roller or spray). Both low-VOC coatings and conventional coatings for both architectural and industrial maintenance applications have demonstrated the ability to adhere to a variety of surfaces. As a part of the technology assessment, the product data sheets were analyzed for a variety of low-VOC primers, including stain-blocking primers, primers that adhere to alkyds, and primers that have equal coverage to conventional solvent-borne primers, sealers, and undercoaters (CARB, 2000).

As a result, based on the coating manufacturer's coating product data sheets, the material needed and time necessary to prepare a surface for coating is approximately equivalent for conventional and low-VOC coatings. More primers are not needed because low-VOC coatings possess comparable coverage to conventional coatings, similar adhesion qualities and are consistently resistant to stains, chemicals and corrosion. Low-VOC coatings tend not to require any special surface preparation different from what is required before applying conventional coatings to a substrate. As part of good painting practices for any coating, water-borne or solvent-borne, the surface typically needs to be clean and dry for effective adhesion. Consequently, claims of significant adverse air quality impacts resulting from more priming are unfounded.

More Topcoat: Another issue raised in the past relative to low VOC coatings is the assertion that reformulated compliant water- and low-VOC solvent-borne topcoats may not cover, build, or flow-and-level as well as the solvent-borne formulations. Therefore, more coats are necessary to achieve equivalent cover and coating build-up.

Technology breakthroughs with additives used in recent formulations of low-VOC coatings have minimized or completely eliminated flow and leveling problems. These flow and leveling agents mitigate flow problems on a variety of substrates, including plastic, glass, concrete and resinous wood. These additives even assist in overcoming flow and leveling problems when coating oily or contaminated substrates. According to the product data sheets for the sampled coatings, water-borne coatings have proven durability qualities. Comparable to conventional coatings, water-borne coatings for architectural applications are resistant to scrubbing, stains, blocking and UV exposure. Coating manufacturers, such as Dunn-Edwards, ICI, Pittsburgh Paints and Sherwin Williams, formulate low-VOC nonflat coatings (<150 g/l) with high build and excellent scrubability. Most of the coatings are mildew resistant and demonstrate excellent washability characteristics. The coverage of the coatings average around 400 square feet per gallon, which is equivalent to the coverage of the conventional nonflat coatings. Con-Lux, Griggs Paint and Spectra-Tone also formulate even lower VOC (<50 g/l) coatings that also demonstrate excellent durability, washability, scrubability and excellent hide. The coverage is again equivalent to the conventional coatings around 400 square feet per gallon (CARB, 2000).

Both low-VOC and conventional coatings have comparable coverage and superior performance. These low-VOC coatings possess scrub and stain resistant qualities,

blocking and resistance to ultraviolet (UV) exposure for the exterior coatings. Both low-VOC and conventional Industrial/Maintenance (IM) coatings tend to have chemical and abrasion resistant qualities, gloss and color retention, and comparable adhesion qualities. With comparable coverage and equivalent durability qualities, additional topcoats for low-VOC coatings should not be required.

More Touch Up and Repair Work: Another potential issue related to low VOC coatings is the assertion that reformulated compliant water- and low-VOC solvent-borne formulations dry slowly, and are susceptible to damage such as sagging, wrinkling, alligatoring, or becoming scraped and scratched. It is also claimed that the high-solids solvent-borne alkyd enamels tend to yellow in dark areas, and that water-borne coatings tend to blister or peel, and also result in severe blocking problems. As a result, additional coatings for repair and touch-up would be necessary.

Extra touch-up and repair and more frequent coating applications are related to durability characteristics of coatings. Product data sheets were evaluated and recent studies conducted to obtain durability information for low-VOC coatings and conventional coatings. Based on information in the coating product data sheets, comparable to conventional coatings, water-borne coatings for architectural applications are resistant to scrubbing, staining, blocking and UV exposure. They were noted for excellent scrubability and resistance to mildew. The average drying time between coats for the low-VOC coatings (<150 g/l) was less than the average drying time for the conventional coatings (250 g/l). The average drying time for the lower-VOC coatings (<50 g/l) did increase more than the conventional coatings. However, with the development of non-volatile, reactive diluents combined with hypersurfactants, performance of these nearly zero-VOC coatings has equaled, and for some characteristics, outperformed traditional, solvent containing coatings (CARB, 2000).

Therefore, based on the durability characteristics information contained in the coating product data sheets, low-VOC coatings and conventional coatings have comparable durability characteristics. As a result, it is not anticipated that more touch up and repair work will need to be conducted with usage of low-VOC coatings. Consequently, claims of significant adverse air quality impacts resulting from touch-up and repair for low-VOC coatings are unfounded.

More Frequent Recoating: An issue raised in past rulemaking is the assertion that the durability of the reformulated compliant water- and low-VOC solvent-borne coatings is inferior to the durability of the traditional solvent-borne coatings. Durability problems include cracking, peeling, excessive chalking, and color fading, which all typically result in more frequent recoating. As a result, it is possible more frequent recoating would be necessary resulting in greater total emissions than would be the case for conventional coatings.

The durability of a coating is dependent on many factors, including surface preparation, application technique, substrate coated, and exposure conditions. Again, as mentioned above, key durability characteristics, as discussed in coating product data sheets, (e.g., resistance to scrubbing, abrasion, corrosion, chemicals, impact, stain, and UV), are

similar between conventional and low-VOC coatings. Both coating types pass abrasion and impact resistance tests, and have similar durability qualities. According to the coating product data sheets, low-VOC coatings would not need more surface preparation than what needs to be done to prime the surface for conventional coatings (see also "More Priming" discussion above). The technique for applying the coatings did not significantly differ either. It is expected that if applied using manufacturers' recommendations, compliant low-VOC coatings should be as durable as conventional coatings and, therefore, no additional recoating could occur as a result of the usage of low-VOC coatings. Furthermore, overall durability is dependent on the resin used in the formulation as well as the quality of pigment, not just the VOC content of the coating.

Coatings manufacturers' own data sheets indicate that the low-VOC coatings for both architectural and industrial maintenance applications are durable and long lasting. Any durability problems experienced by the low-VOC coatings are not different than those seen with conventional coatings. Recent coating technology has improved the durability of new coatings. Because the durability qualities of the low-VOC coatings are comparable to the conventional coatings, more frequent recoatings would not be necessary.

Substitution: Some have claimed that since reformulated compliant water- and low-VOC solvent-borne coatings are inferior in durability and are more difficult to apply, consumers and contractors will substitute better performing high VOC coatings in other categories for use in categories with low compliance limits. An example of this substitution could be the use of a rust preventative coating, which has a higher VOC content limit requirement, in place of an industrial/maintenance coating or a nonflat coating.

There are several reasons why widespread substitution is not expected to occur. First and foremost, based on staff research of resin manufacturers' and coating formulators' product data sheets as well as recent studies conducted by ARB, have shown that there are, generally, a substantial number of low-VOC coatings in a wide variety of coating categories that are currently available. These coatings have performance characteristics comparable to conventional coatings. Second, coating rules can be developed to prohibit the application of certain coatings in specific settings. For example, IM coatings cannot be used in residential, commercial, or institutional settings. Also, rust preventive coatings cannot be used in industrial settings. Third, the type of performance (e.g., durability) desired in some settings would prohibit the use of certain coatings. For example, in the typical IM setting a coating with a life of 10 years or more is desired due to the harshness of the environment. Therefore, it is unlikely that an alkyd-based rust preventive coating with a typical life of five years would be used in place of an industrial/maintenance coating. Fourth, coatings rules typically require that when a coating can be used in more than one coating category, the lower limit of the two categories is applicable. It is highly unlikely that coating applicators will violate future coatings rules by substituting higher-VOC coatings for lower-VOC coatings.

As discussed above, CARB does not expect that low-VOC coatings used for specific coating applications will be substituted with higher-VOC coatings used for other specific types of coating applications (CARB, 2000). Currently, there are a substantial number of low-VOC coatings in a wide variety of coating categories that have performance characteristics comparable to conventional coatings. Moreover, the type of performance desired in some settings would prohibit the use of certain coatings in those settings.

In the rare event that substitution does occur, it is expected that future coatings would still achieve overall VOC emission reductions. Substitution would only result in less emission reductions than expected, it would not increase emissions as compared to the existing setting. Consequently, it is not expected that control measures requiring a lower overall VOC content of coatings will result in significant adverse air quality impacts from the substitution of low-VOC coatings with higher-VOC coatings.

More Reactivity: Different types of solvents have different degrees of "reactivity," which is the ability to accelerate the formation of ground-level ozone. Some coating manufacturers and coating contractors assert that the reformulated compliant low-VOC water- and solvent-borne coatings contain solvents that are more reactive than the solvents used in conventional coating formulations. Furthermore, water-borne coatings perform best under warm, dry weather conditions, and are typically recommended for use between May and October. Since ozone formation is also dependent on the meteorological conditions, it has been asserted that the use of waterborne coatings during this period increases the formation of ozone.

The use of reactivity as a regulatory tool has been debated at the local, state, and national level for over 20 years. For example, CARB incorporated a reactivity-based control strategy into its California Clean Fuel/Low Emissions Vehicle regulations, where reactivity adjustment factors are employed to place regulations of exhaust emissions from vehicles using alternative fuels on an equal ozone impact basis. CARB is evaluating a similar strategy for consumer products and industrial emissions, and contracted with Dr. William Carter, University of California at Riverside, Center for Environmental Research and Technology, College of Engineering, for a two-year study to assess the reactivities of VOC species found in the consumer products emissions inventory. Dr. Carter, one of the principal researchers of reactivities of various VOC species, plans to further study VOC species, more specifically glycol ethers, esters, isopropyl alcohol, methyl ethyl ketone (MEK), and an octanol, since these are typically found in either waterborne coatings, solvent-borne coatings, or both. These specific VOCs have been prioritized based on emissions inventory estimates, mechanistic uncertainties, and lack of information in the current reactivity data. Under the current models and ozone chamber studies, however, Dr. Carter has been unable to assess the reactivity of low volatility compounds, and has not succeeded in reducing the uncertainties in the reactivity of key VOC species used in industrial and maintenance coatings. He did identify the state of science with respect to VOC reactivity and described areas where additional work is needed in order to reduce the uncertainty associated with different approaches to assessing reactivity (CARB, 2000).

In the absence of actual reactivity numbers for the compounds contained in "traditional" solvent formulations and compliant, low-VOC coatings, emissions must be calculated in the standard manner of total VOC per unit of coating. Based upon the current state of knowledge regarding VOC reactivity, it is speculative to conclude that these control measures will generate significant adverse air quality impacts due to increased reactivity.

On June 16, 1995, the U.S. EPA determined that acetone, p-chlorobenzotriflouride (PCBTF), and VMS (as well as other solvents) have low photochemical reactivity and should be exempted from consideration as a VOC. Oxsol 100 (PCBTF), manufactured by Occidental Chemical Corporation, was also delisted as a VOC in 1995. This solvent can be used to extend or replace many organic solvents, including toluene, xylene, mineral spirits, acetone, methyl ethyl ketone, trichloroethylene, and perchloroethylene. Toxicity data of PCBTF was assessed by the Office of Environmental Health Hazard Assessment (OEHHA) and it was not considered to have a significant toxic risk. This product is less toxic than toluene, and is not considered a Hazardous Air Pollutant or an Ozone-Depleting Substance. The U.S. EPA is also in the process of delisting t-butyl acetate, which may also help coating formulators in utilizing exempt solvents in their formulations.

Synergistic Effects of the Eight Issues: It has been asserted in the past that not only should each of the eight issues (i.e., more thickness, illegal thinning, more priming, more topcoats, more touch-up and repair, more frequent recoating, more substitution, and more reactivity) be analyzed separately but that the synergetic effect of all issues be analyzed. CARB staff analysis determined that based on the National Technical Service (NTS) data (see below) and review of product data sheet, the low-VOC compliant coatings have comparable performance as conventional coatings. Therefore, since individually each issue does not result in a significant adverse air quality impact, the synergistic effect of all eight issues will not result in significant adverse air quality impacts (CARB, 2000). Even if it is assumed that some of the alleged activities do occur, e.g., illegal thinning, substitution, etc., the net overall effect of the proposed amendments is expected to be a reduction in VOC emissions.

NTS Study: A study by NTS was initiated to assess application and durability characteristics of zero-VOC, low-VOC, and high-VOC coatings in order to supplement information collected by the SCAQMD, as part of a technology assessment.

The results of the NTS study show that zero-VOC coatings available today, when compared to high-VOC coatings are equal, and in some cases, superior in performance characteristics, including coverage, mar resistance, adhesion, abrasion resistance, and corrosion protection. However, the NTS results also highlight application characteristics of some zero-VOC nonflat and PSU coatings that are somewhat limited when compared to solvent-based, high-VOC coatings. Those include lower rankings for leveling, sagging and brushing properties. However, for industrial/maintenance coatings, zero and low-VOC coatings performed better than high-VOC coatings. In addition to the laboratory results, the NTS study was expanded with additional testing, including accelerated actual exposure, real time actual exposure, and actual field application characteristics. In sum,

the results of the NTS study indicate that some, but not all of the zero-VOC coatings may have some degraded application characteristics. This means that when promulgating coatings rules or rule amendments, sufficient research and development time should be allowed to correct potential coating application problems.

Conclusion: Based on the preceding analysis of potential secondary air quality impacts from implementing future coatings rules, it is concluded that the overall air quality effects will be a VOC emission reduction. Therefore, based on the significance criteria, impacts associated with the use of lower VOC coatings will be less than significant.

PROJECT-SPECIFIC MITIGATION: No significant secondary air quality impacts from coating reformulation have been identified so no mitigation measures are required.

Secondary Impacts from Control of Stationary Sources

PROJECT SPECIFIC IMPACTS: Emission reductions from the control of emissions at several stationary sources could result in secondary emissions. Options for further NOx emission reductions could include addition of control equipment [selective catalytic reduction (SCR)], process changes to reduce emissions or require that new equipment meet more stringent emission limits. Installation of new SCR equipment or increasing the control efficiency of existing equipment would be expected to increase the amount of ammonia used for NOx control. As a result ammonia slip emissions could increase, thus, contributing to PM10 concentrations. Ammonia can be released in liquid form, thus, directly generating PM10 emissions. Ammonia can also be released in gaseous form where it is a precursor to PM10 emissions. Injecting ammonia at the proper molar ratio, increasing the amount of catalyst used, or installing scrubbers can minimize potential increases in ammonia slip emissions.

Control Measures SS 14 – Stationary Gas Turbines could reduce NOx by using SCR, which may potentially result in increased ammonia emissions due to "ammonia slip" (release). Ammonia slip can worsen as the catalyst ages and becomes less effective. Ammonia slip from SCR equipment is continuously monitored and controlled. A limit on ammonia slip is normally included in permits to operate for stationary sources, which should minimize potential air quality impacts associated with ammonia slip from these sources.

A number of control measures would result in a decrease in VOC emissions from various facilities including: (1) SS 3 – High Emitting Spray Booths; and (2) SS 6 – Flares. The methods to control fugitive emissions could include leakless valves and vapor recovery devices. Some vapor recovery devices, e.g., afterburners, incinerators, or flares, might also be installed resulting in combustion emissions, including NOx and CO emissions. While some control measures may cause a small increase in CO and NOx emissions, the 2005 Ozone Strategy control measures will achieve an overall reduction in VOC and NOx. The emission control devices require air permits to operate. Emissions from vapor recovery devices are generally controlled by using efficient combustion practices, therefore, secondary impacts from these control measures are not expected.

Conclusion: Based on the discussion above and the impact evaluation criteria, secondary air quality impacts from stationary source control measures are expected to be less than significant.

PROJECT-SPECIFIC MITIGATION: No significant secondary air quality impacts from control of stationary sources have been identified so no mitigation measures are required.

Potential Adverse Impacts and Ozone Transport

PROJECT-SPECIFIC IMPACTS: It has been well established that both NOx and VOC are involved in the formation of ground-level ozone, and thus reducing NOx emissions generally lowers ozone formation. However, studies have shown that lowering NOx alone can, under conditions of low VOC to NOx ratios, lead to localized increases in ozone. At sufficiently low VOC to NOx ratios, reducing NOx can increase ozone production efficiency, potentially resulting in higher ozone concentrations. This phenomenon has been investigated as a likely cause of the so-called "ozone weekend effect."

The "ozone weekend effect" refers to the observation that ozone measurements in some locations, primarily large metropolitan areas, are typically higher on weekends compared to weekdays. Smog-forming emissions mostly come from sources such as cars, trucks, factories, and fossil-fuel power plants that produce lower total emissions on weekends than on weekdays. One theory as to what causes the weekend effect indicates that many urban areas of the state are VOC-limited, and therefore reducing NOx emissions disproportionately in relation to VOC emissions will cause ozone concentrations to increase. The California Air Resources Board (CARB) has been studying the weekend effect because it has become a regulatory issue. It has been offered by some as evidence that reductions of NOx emissions alone would be counter-productive for reducing ambient ozone levels.

Understanding the weekend effect is not a simple task because ozone formation, transport, and destruction in the lower atmosphere are highly complex processes. The CARB is currently evaluating various possible explanations of the ozone weekend effect. The hypotheses address temporal, spatial, and compositional changes in emissions from weekdays to weekends and how these changes might interact with meteorological and photochemical processes to produce the observed weekday to weekend differences in ozone concentrations (CARB, 2003).

Although in the Bay Area NOx reductions alone have the potential to increase ozone, a strategy of concurrent reductions of the major precursors of ozone, VOC and NOx, has been used for about 15 years to reduce ozone levels in the Bay Area on all days of the week, including weekends. Historical trends of air monitoring data show substantial reductions in ozone concentrations and therefore the public's exposure to ozone on both weekend and weekdays. Combined reductions of VOC and NOx, thus are not counter-

productive for attaining ambient air quality standards. The 2005 Ozone Strategy includes control measures that will reduce both NOx and VOC. This strategy is expected to prevent an increase in ozone concentration that might occur from decreases in only NOx emissions.

While the degree of pollutant transport and its effect on ozone concentrations in affected areas have not yet been quantified, the effect of the 2005 Ozone Strategy on ozone precursor pollutants to downwind regions is clear. Decreasing VOC and NOx emissions within the Bay Area through implementation of the Ozone Strategy is expected to decrease ambient ozone concentrations in the Bay Area and to decrease the available ozone and ozone precursors available for transport into neighboring air basins. Therefore, implementation of the proposed Ozone Strategy is not expected to result in any adverse impacts associated with the transport of ozone or ozone precursors to neighboring air basins.

In 2003, the CARB amended State regulations on ozone transport mitigation. CARB retained the requirement for upwind transport Districts, such as the Bay Area, to apply best available retrofit control technology (BARCT). CARB also added two new requirements related to the adoption of all feasible measures and no net increase thresholds for new source review permitting programs. These measures should further reduce transport impacts, if any, on neighboring districts.

The District amended Rule 2-2 requiring new or modified permitted sources that emit or have the potential to emit 10 tons or greater per year of an ozone precursor to fully offset their emission increase. In addition, implementation of the 2005 Ozone Strategy will fulfill the District's obligation to adopt all feasible measures. The emissions reductions from these measures are also expected to reduce transport impacts.

Conclusion: Based on the above analysis, the potential air quality impacts from increased ozone concentrations due to decreased NOx emissions proposed as part of the 2005 Ozone Strategy is considered less than significant. In addition, the potential impacts to downwind areas from the reduction of NOx and VOC emissions resulting from the 2005 Ozone Strategy is considered less than significant.

PROJECT-SPECIFIC MITIGATION: Air quality impacts due to the "weekend effect" and ozone transport are not significant so no mitigation measures are required.

Secondary Air Quality Impacts from Construction Activities

The BAAQMD considers construction emission impacts to be less than significant if the construction mitigation measures listed in the District's CEQA Guidelines are used. The District guidelines only address particulate matter (dust), not exhaust emissions from diesel powered equipment.

While implementing the 2005 Ozone Strategy control measures is expected to reduce operational emissions, construction-related activities associated with installing or

replacing equipment, for example, are expected to generate emissions from construction worker vehicles, trucks, and construction equipment. Implementation of some of the control measures will require construction of new infrastructure including construction of controls at stationary sources (e.g., SCR systems and domes on tanks), construction of additional bus, rail and ferry facilities, construction of new High Occupancy Vehicle (HOV) lanes, and construction of additional bicycle lanes.

The inventory prepared for the 2005 Ozone Strategy includes estimates of the construction emission inventory for construction activities in 2003 and 2010 (see Table 3.4-10). It is assumed that construction activities to implement control measures in the 2005 Ozone Strategy, e.g., (1) additional infrastructure to support electric and alternative fuel vehicles; (2) additional infrastructure to support new HOV lanes; (3) construction of additional bus, rail and ferry facilities; and (4) additional infrastructure to support electrification of new sources contribute to construction activity emission inventories.

TABLE 3.4-10

Estimated Construction Emissions in the Bay Area
(Tons/Day)

Source Category	ROG	NOx
2003 Emission Inventory		
Construction and Mining Equipment	10.7	91.1
2010 Emission Inventory		
Construction and Mining Equipment	6.4	62.9
Emission Reductions (Emissions in 2003 – emissions in 2010)	4.3	28.2

Source: BAAQMD, 2004

Construction activities include the installation of control equipment on existing stationary sources, which would not involve extensive construction activities and would not be expected to result in significant emissions. Other construction activities could involve the installation of new transportation infrastructure. As shown in Table 3.4-10, the estimated VOC and NOx emissions associated with construction in the Air District are expected to be reduced between the 2003 and 2010 inventories, resulting in an air quality benefit. CARB control measures, in particular new emission standards for off-road mobile sources, are the main source of the reduction in combustion emissions from off-road equipment expected between the 2003 and 2010 inventories.

The estimated PM10 emissions associated with construction activities are expected to follow the same trend, resulting in decreased emissions between 2003 and 2010 because the CARB control measures are also aimed at reducing diesel particulate emissions.
Construction emissions associated with dredging for the new ferry facilities are estimated in Table 3.4-11. As discussed in the EIR prepared for the ferry facilities (WTA, 2003),

each individual ferry expansion should employ the current BAAQMD-recommended construction mitigation measures to reduce impacts.

TABLE 3.4-11

Criteria Pollutant Emissions from Dredging Associated with TCM 7 – Improve Ferry Service at Hercules/Rodeo

Source	VOC	NOx	CO	PM10	SO_2
Tug Engine (lb/day)	9.5	187.3	10.7	10.7	6.0
Dredging Engine (lb/day)	17.6	121.7	149.9	7.1	3.5
TOTAL (lbs/day)	**27.2**	**309.0**	**160.7**	**17.8**	**9.5**
Tug Engine (ton)	0.06	1.17	0.07	0.07	0.04
Dredging Engine (ton)	0.11	0.76	0.94	0.04	0.02
TOTAL (ton)	**0.17**	**1.93**	**1.00**	**0.11**	**0.06**

Source: WTA, 2003

The 2005 Ozone Strategy is not expected to result in an overall increase in emissions of regional pollutants, therefore, these impacts are not significant. Further, construction projects are expected to implement the BAAQMD construction mitigation measures for particulate matter, so that secondary air quality impacts from construction impacts are not expected to be significant.

Conclusion: Based on the above evaluation and significance criteria, the secondary air quality impacts from construction activities are expected to be less than significant.

PROJECT-SPECIFIC MITIGATION: Each individual project should employ the current BAAQMD-recommended construction emissions to reduce impacts. Secondary air quality impacts from construction activity are not significant so no mitigation measures are required.

Secondary Impacts from Increased Electricity Demand

PROJECT-SPECIFIC IMPACTS: Electricity is often used as the power source to operate various components of add-on control equipment, such as ventilation systems, fan motors, vapor recovery systems, etc., and from the increase electrification of mobile sources. Increased demand for electrical energy may require generation of additional electricity, which in turn could result in increased indirect emissions of criteria pollutants in the Bay Area and in other portions of California.

Control measures that could result in an increase in electricity use include measures that would require add-on controls, including SS 3 – High Emitting Spray Booths. The stationary source measures that may result in increased demand for electrical energy due

to operation of add-on control equipment are included in Table 3.4-8. Some of the transportation control measures would include electrification of mobile sources including MS 3 – Low Emission Vehicle Incentives and TCM 4 – Upgrade and Expand Local and Regional Rail Service.

An increase in the use of electric vehicles would require the generation of additional electricity in the Air District and other areas of California. The potential increase and amount of electricity is unknown. Because the control measures are general in nature, it is difficult to determine what, if any, impacts could be expected. Several control measures target emission reductions from transportation measures that would encourage the development of vehicle control technology to meet or exceed ultra-low emission vehicle standards. Such technology would include electric and advance hybrid electric vehicles as a result of advanced battery technology and development of property support infrastructure. The increased demand for electrical energy may require generation of additional electricity, which in turn may result in increased indirect emissions of all criteria pollutants (due to the increase in natural gas combustion used to generate more electricity). The amount of electricity generated is described in the energy impacts Subchapter 3.17 of this EIR.

Electrification of motor vehicles and other commercial and industrial equipment will reduce petroleum fuel usage in the Bay Area. At that time, there may be an increase in emissions due to increased electric power generation due to increased demand. The number of electric vehicles is unknown at this time. While the control measures may cause an increase in NOx emissions associated with increased electricity generation, overall the 2005 Ozone Strategy should achieve a net reduction in NOx emissions.

An incremental increase in electricity demand would not create significant adverse air quality impacts. However, if electricity demand exceeds available power, additional sources of electricity would be required. Electricity generation within the Air District is subject to BAAQMD Regulation 9, Rule 9, which regulates NOx emissions (the primary pollutant of concern from combustion to generate electricity) from existing power generating equipment. Regulation 9, Rule 9 establishes NOx concentration limits from electric generating facilities. As a result, NOx emissions from existing electric generating facilities will not increase significantly, regardless of increased power generation for add-on control equipment or electrification activities.

New power generation equipment would be subject to Regulation 9, Rule 9. New power generating equipment would not result in air quality impacts because they would be subject to BACT requirements, and all emission increases would have to be offset (through emission reduction credits) before permits could be issued. Further, emissions from the combustion of gasoline or diesel fuels are generally the emissions that would be reduced when electrification is proposed and replaced with emissions from the combustion of natural gas (as would generally occur from electricity generating facilities). Emissions from diesel combustion (e.g., rail engines) are orders of magnitude higher than emissions from the combustion of natural gas. So overall emissions are

expected to decrease. No significant adverse impacts to air quality are expected from control measures requiring electricity use.

The emissions from electrical generation have been included in the emissions inventory prepared for the 2005 Ozone Strategy. Table 3.4-12 summarizes the emissions associated with electric generation in 2003 and 2010.

TABLE 3.4-12

Annual Average Emissions for Electric Generation in the Bay Area (tons/day)

Source Category	VOC	NOx
2003 Emission Inventory[(1)]		
Cogeneration	1.0	5.0
Power Plants	0.2	2.8
Total:	**1.2**	**7.8**
2010 Emission Inventory[(1)]		
Cogeneration	1.1	5.4
Power Plants	0.2	2.7
Total:	**1.3**	**8.1**
Emission Increases (Emissions in 2010 minus emissions in 2003)	0.1	0.3
Emission Increases Converted to Pounds per Day	200	600
Projected Increase Associated with the Ozone Strategy[(2)] (lbs/day)	20	60

(1) Source: BAAQMD, 2004

(2) Assumes that overall increase in electricity associated with the Ozone Strategy is about one percent of the increases in electricity generation that occurs between the years 2003 and 2010.

The inventory prepared for the 2005 Ozone Strategy includes estimates for cogeneration and power plants in 2003 and 2010. It is assumed that the emissions associated with electrical generation that are part of the control measures would partially contribute to the emission changes identified in the emission inventories. The inventory also accounts for growth in population. It has been estimated that implementation of all the control measures is expected to result in an overall increase in electricity in 2010 of less than one percent, relative to the projected peak electricity demand in 2010. The estimated VOC and NOx emissions due to increased electrical demand associated with implementation of the Ozone Strategy are expected to increase, but the overall VOC and NOx emissions are expected to be less than current emissions. Based on Table 3.4-12 and due to the existing regulations that would apply to the generation of electricity in the Bay Area, emissions from power generating equipment in the Air District are not expected to be significant.

The BAAQMD does not regulate electricity generating facilities outside of the Air District so the rules and regulations discussed above do not apply to electricity generating facilities outside of the Air District. About 82 percent of the electricity used in California is generated in-state and about 18 percent is imported (see Section 3.16.1). While these electricity generating facilities would not be subject to BAAQMD rules and regulations, they would be subject to the rules and regulations of the local air pollution control District and the U.S. EPA. These agencies also have established New Source Review regulations for new and modified facilities that generally require compliance with BACT or lowest achievable emission reduction technology. Most electricity generating plants use natural gas, which provides a relatively clean source of fuel (as compared to coal- or diesel-fueled plants). The emissions from these power plants would also be controlled by local, state, and federal rules and regulations, minimizing overall air emissions. These rules and regulations may differ from the BAAQMD rules and regulations because the ambient air quality and emission inventories in other air districts are different than those in the Bay Area. Compliance with the applicable air quality rules and regulations are expected to minimize air emissions in the other air districts to less than significant.

Electricity in California is also generated by alternative sources that include hydroelectric plants (about 23 percent), geothermal energy (about five percent), wind power (one percent), and solar energy (less than one percent) which are clean sources of energy. These sources of electricity generate little, if any, air emissions. Increased use of these and other clean technologies will continue to minimize emissions from the generation of electricity.

Conclusion: Based on the above evaluation and significance criteria, the secondary air quality impacts due to electricity generation are expected to be less than significant.

PROJECT-SPECIFIC MITIGATION: No significant secondary air quality impacts from increased electricity demand have been identified so no mitigation measures are required.

Emissions from Mobile Sources

PROJECT-SPECIFIC IMPACTS: MS 3 – Low Emission Vehicle Incentives could require the use of clean fuels and use of alternative fuels, such as compressed natural gas or hydrogen, and could include other types of alternative fuels. Clean fuels are expected to be fuels other than petroleum fuels (e.g., natural gas) so that no modifications are required to refineries and no increase in emissions from refineries is expected. The use of alternative fuels, such as compressed natural gas, would be expected to displace petroleum-based fuels. The use of alternative fuels in mobile sources is expected to result in fewer air emissions than the use of petroleum-based fuels. Therefore, no significant impacts on air quality would be expected from the implementation of measure MS3.

Although overall the 2005 Ozone Strategy is anticipated to reduce emissions, compared to the existing baseline and No Project Alternative, some control measures could

encourage increased traffic and related emissions in localized areas (e.g., TCM 1 - Support Voluntary Employer-Based Trip Reduction Programs, TCM 3 - Improve Local and Areawide Bus Service, TCM 4 - Improve Regional Rail Service, TCM 6 - Improve Interregional Rail Service, TCM 7 - Improve Ferry Service, and TCM 15 - Local Land Use Planning and Development Strategies), and TCM 13 - Transit Use Incentives). These control measures could result in increased traffic near transit terminals, thus, generating increases in emissions, particularly CO emissions or CO "hot spots," in the local areas surrounding the transit terminals. While localized CO impacts are unlikely due to statewide use of oxygenated fuels and declining trends in background CO concentrations, the level of analysis provided in this Program DEIR prevented the District from concluding the impact would be less than significant. Therefore, localized increases in CO emissions are considered potentially significant.

The proposed Transportation Control Measures, such as TCM 15 include measures that would reduce traffic within mixed-use development including providing pedestrian pathways, providing transit benches and shelters, providing bicycle infrastructure (e.g., bike racks), providing bike routes, etc. Therefore, an overall decrease in vehicle miles traveled and air emissions would be anticipated regionally with implementation of the control measures contained in the 2005 Ozone Strategy.

Implementation of TCM 7 – Improve Ferry Service would result in a decrease in emissions of NOx and PM10 from passenger cars, buses and ferries. However, as shown in Table 3.4-13, a region-wide increase in emissions of SOx, VOC and CO would occur. Further, the potential increase in cold-start emissions during the evening commute could lead to a violation of the short-term carbon monoxide standard which is also considered a significant adverse impact (WTA, 2003). The change in emissions associated with TCM 7 for NOx and PM10 are expected to be beneficial, i.e., result in an emission decrease (NOx and PM10), or less than significant because they are regional pollutants. Although TCM 7 could result in an increase in certain pollutants, implementation of the 2005 Ozone Strategy is expected to result in an overall reduction in NOx and VOC emissions.

TCM 11 – Install Freeway Traffic Management Systems is aimed at reducing congestion on freeways. However, the increased use of ramp metering may result in increased traffic and congestion of local streets leading onto the freeway. Increased traffic could result in CO hot spots in areas near freeway on-ramps generating potentially significant impacts.

TABLE 3.4-13

Summary of Criteria Pollutant Emissions from Ferries (TCM 7)

Emissions (lbs/day)	Year 2025 without TCM 7	Year 2025 with TCM 7	Increase in Emissions from Future Baseline (lbs/day)
NOx	2,929	1,249	-1,680
SOx	101	550	449(1)
PM10	175	37	-137
CO	169	684	515(1)
VOC	155	338	183(1)

Source: WTA, 2003
(1) Increase in emissions were considered potentially significant in the WTA (2003) EIR.

Conclusion: The 2005 Ozone Strategy is expected to result in an overall reduction in emissions from mobile sources on a regional basis. However, some control measures could encourage increased traffic and related emissions in localized areas (e.g., TCM 1, TCM 3, TCM 4, TCM 6, TCM 7, TCM 13, and TCM 15). These control measures could result in increased traffic near transit terminals, thus, generating increases in emissions, particularly CO emissions or CO "hot spots," in the local areas surrounding the transit terminals. While localized CO impacts are unlikely due to statewide use of oxygenated fuels and declining trends in background CO concentrations, the level of analysis provided in this Program DEIR prevented the District from concluding the impact would be less than significant. Therefore, based on the above evaluation and significance criteria, the potential for localized increases in CO emissions is considered a significant impact.

PROJECT-SPECIFIC MITIGATION: The increase in cold start emissions and localized CO emissions can be reduced by encouraging non-drive access at the ferry terminals and encouraging implementation of other control measures such as TCM 5 - Improve Access to Rail and Ferries, and TCM 9 – Improve Bicycle Access and Facilities. However, the effectiveness of these mitigation measures cannot be quantified so the impact remains significant. Project level environmental analysis on the implementation of the various TCMs will be required to determine the potential for impacts at specific locations.

The WTA is planning to continue investigating the feasibility and applicability of using energy sources other than fossil fuels and different engine technologies. One promising technology is the use of fuel cells. Alternative energy sources and engine technologies are expected to become available and will be incorporated as they become feasible (WTA, 2003). Alternatives to diesel-fueled buses and rail engines must also be considered to minimize localized emissions at buses, ferry and rail terminals. However,

as future technology cannot be predicted, and the overall effects of the implementation of the TCMs cannot be reasonable assesses at this time, this impact remains significant.

Miscellaneous Air Quality Issues

The purpose of the 2005 Ozone Strategy is to assure the Bay Area continues progress toward attaining the State one-hour ozone standard through implementation of different control measures. By revising and updating emission inventories and control strategies and preparing the 2005 Ozone Strategy, the BAAQMD is complying with State law. The 2005 Ozone Strategy further identifies the rules and regulations that the BAAQMD and other agencies will be working to implement in the near future. Therefore, issues on the CEQA environmental checklist related to impacts on the existing air quality plan, rules and regulations or future compliance dates are not applicable to the 2005 Ozone Strategy. The 2005 Ozone Strategy establishes a new air quality plan and identifies control measures that will be implemented through adoption of rules and regulations to achieve compliance with the State ozone standard as expeditiously as practicable. No significant adverse impacts are anticipated on the existing 2000 air quality plan as the 2005 Ozone Strategy includes additional control measures that were not included in the 2000 Clean Air Plan that will lead to even further emission reductions. Therefore, no significant adverse impacts have been identified for the CEQA environmental checklist topics under air quality plan, rules and regulations, and future compliance dates.

3.4.3.2 Non-Criteria Pollutants

PROJECT SPECIFIC IMPACTS: Several control measures that are proposed in the 2005 Ozone Strategy may result in the substitution of solvents. When a product is reformulated to meet new VOC limits, however, a manufacturer could use a chemical, not used before, that may be a toxic air contaminant. This potential impact will need to be evaluated and mitigated as reformulation options are reviewed during the development of new VOC limits.

Two particular TACs used in some consumer products, methylene chloride and perchloroethylene, are specifically exempted from the VOC definition because of their very low ozone-forming capabilities. As a result, some manufacturers may choose to use methylene chloride or perchloroethylene in the reformulations to reduce the VOC content in meeting future limits. Product liability and regulations such as California's Proposition 65 are expected to minimize the use of toxic materials because manufacturer's would have to provide public notices if any Proposition 65 listed-material is used. In addition, the BAAQMD has established a Toxic Air Contaminant Program that would be expected to minimize TACs at stationary sources.

There is a potential that the exempt compounds may create air quality impacts if the exempt solvents contain toxic compounds that are not regulated by the State and federal TAC programs or by the BAAQMD's TAC rules. The potential impacts will need to be analyzed for each control measure during the rulemaking process. The BAAQMD does not exempt negligibly photochemically reactive compounds that are ozone depletors or

toxic air contaminants. Therefore, there is no incentive to use these toxic solvents or ozone depleting solvents.

Although overall the 2005 Ozone Strategy is anticipated to reduce emissions, compared to the existing baseline and No Project Alternative, some control measures could encourage higher traffic and related emissions in localized areas, including emissions of diesel exhaust. CARB estimates that diesel exhaust particulate matter contributes 71 percent to the total cancer risk (see Table 3.4-6) (CARB, 2000). TCMs that encourage the use of mass transit or increase service by transportation that uses diesel fuel could result in increased emissions of diesel exhaust, including TCM 1 - Support Voluntary Employer-Based Trip Reduction Programs, TCM 3 - Improve Local and Areawide Bus Service, TCM4 - Improve Regional Rail Service, TCM 6 - Improve Interregional Rail Service, TCM 7 – Improve Ferry Service, TCM – 13 Transit Use Incentives and TCM 15 – Local Land Use Planning and Development Strategies). TCM 15 – Local and Land Use Planning and Development Strategies could concentrate traffic in specific areas. TCM 15 also includes measures that would reduce traffic within mixed-use development including providing pedestrian pathways, providing transit benches and shelters, providing bicycle infrastructure (e.g., bike racks), providing bike routes, etc. Further, MS 1 – Diesel Equipment Idling Ordinance could reduce emissions from diesel engines due to idling. On balance, an overall decrease in vehicle miles traveled and air emissions would be anticipated regionally; however, significant air quality impacts associated with the diesel exhaust could occur locally.

Conclusion: Based on the above evaluation and significance criteria, the 2005 Ozone Strategy is expected to result in an overall decrease in vehicle miles traveled and air emissions on a regional basis. However, significant localized air quality impacts associated with diesel exhaust could occur due to certain TCMs that would concentrate traffic in specific areas. Therefore, based on the above evaluation and significance criteria, impacts associated with non-criteria pollutants are considered significant.

PROJECT-SPECIFIC MITIGATION: Significant impacts have been identified for the potential increases of diesel exhaust emissions in localized areas near transit terminals. The increase in emissions can be reduced by encouraging non-drive access at the ferry terminals, such as proposed in TCM 5 – Improve Access to Rail and Ferries, and other measures in the 2005 Ozone Strategy. In addition, substantial statewide diesel emission reductions are expected due to CARB control measures aimed at diesel trucks. However, the effectiveness of these mitigation measures cannot be quantified at a local level so the impact remains significant.

3.4.3.3 Global Warming and Stratospheric Ozone Depletion

The Ozone Strategy as a whole will promote a net decrease in greenhouse gases. The transportation control measures are intended to reduce vehicle miles traveled and they will reduce carbon dioxide emissions from motor vehicles as compared to the No Project Alternative. Other strategies that promote fuel efficiency and pollution prevention will also reduce greenhouse gas emissions, such as SS15 – Promote Energy Efficiency.

Measures that stimulate the development and use of new technologies such as fuel cells will also be beneficial. In general, strategies that conserve energy and promote clean technologies also reduce greenhouse gas emissions.

Conclusion: Overall, the 2005 Ozone Strategy is expected to have a net effect of reducing emissions of compounds that contribute to global warming and stratospheric ozone depletion. Therefore, based on the above evaluation and significance criteria, impacts to global warming and stratospheric ozone depletion are expected to be less than significant.

PROJECT-SPECIFIC MITIGATION: No significant secondary air quality impacts were identified to global warming and stratospheric ozone depletion so no mitigation measures are required.

3.4.4 MITIGATION MEASURES

Mitigation measures have been discussed under each subcategory. In summary, mitigation measures were required due to potential localized increases in CO and diesel particulate emissions, as they could exceed the BAAQMD significance thresholds. While localized CO impacts are unlikely due to statewide use of oxygenated fuels and declining trends in background CO concentrations, the level of analysis provided in this Program DEIR prevented the District from concluding the impact would be less than significant.

3.4.5 CUMULATIVE AIR QUALITY IMPACTS

3.4.5.1 Criteria Pollutants Cumulative Impacts

Some secondary emissions may occur as a result of implementing one or more control measures in the 2005 Ozone Strategy and some of these impacts are considered significant. The overall emission reductions in the 2005 Ozone Strategy are expected to far outweigh any potential secondary adverse air quality impacts that may occur. Each control measure will be subject to more detailed environmental analyses when specific rules or rule amendments are promulgated by the BAAQMD to evaluate the specific technology, identify secondary impacts, and identify feasible mitigation measures, as necessary. Rules implemented by the BAAQMD and other agencies are expected to have a cumulative beneficial impact on air quality by lowering criteria pollutant emissions.

The forecast for the Bay Area includes a significant increase in population with a related increase in traffic (vehicles miles traveled) over the next 25 years. The 2005 Ozone Strategy and other air plans and control measures have been developed, in part, to develop a strategy for attaining and maintaining compliance with ambient air quality standards in spite of this population growth. Emissions of NOx and ROG are expected to decline in the future, even as population and traffic increase due to various control measures. However, emissions of PM10 in the Air District are expected to increase (see Table 3.4-14).

The cumulative effects of the 2005 Ozone Strategy and other air quality rules, regulations, and plans are expected to be a reduction in vehicle miles traveled in the Bay Area compared to the No Project Alternative or baseline, thus providing beneficial impacts to the transportation system as well as air quality. Localized impacts, as discussed in the project-specific impacts above may occur. However, on a cumulative basis, the 2005 Ozone Strategy is expected to result in a reduction in criteria pollutants and therefore, no significant adverse cumulative impacts are anticipated as a result of the implementation of the 2005 Ozone Strategy.

TABLE 3.4-14
Bay Area Predicted Emissions (tons per day)

YEAR	POLLUTANT		
	ROG	NOx	PM10
2003	457	597	200
2005	400	544	204
2010	338	430	211
2020	302	318	232

The control measures proposed by the BAAQMD as part of the 2005 Ozone Strategy are estimated to achieve a total of 10.85 to 11.78 tons per day of ROG emission reductions, and between 9.89 to 10.90 tons per day of NOx emission reductions, providing a beneficial air quality impact (see Table 2-5). The rules implementing these emission reductions have proposed rule adoption schedules between 2004 and 2007.

TCMs that encourage the use of mass transit or increase service by transportation that uses diesel fuel could result in increased emissions and potentially significant localized emissions of CO. On balance, an overall decrease in vehicle miles traveled and air emissions would be anticipated regionally; however, significant air quality impacts associated with CO could occur locally. While localized CO impacts are unlikely due to statewide use of oxygenated fuels and declining trends in background CO concentrations, the level of analysis provided in this Program DEIR prevented the District from concluding the impact would be less than significant. Mitigation measures for these impacts were addressed in the impact specific discussions above.

The overall PM10 emission inventory is expected to increase (see Table 3.4-14). The increase in PM10 emissions is largely associated with increase in population and not the 2005 Ozone Strategy. Control measures to be implemented by CARB are expected to provide additional PM10, ROG and NOx emission reductions in the Air District, primarily associated with reduced emissions from mobile sources and consumer products.

Conclusion: The emission reductions gained by the control measures identified in the 2005 Ozone Strategy are expected to outweigh the potential secondary impacts on a regional basis. As noted in the above discussion on ambient air quality, implementation

of the control measures identified in the 2005 Ozone Strategy is expected to result in emission reductions to further the Bay Area towards compliance with the state ozone standard (even considering the increase in population growth). Considering the air quality benefits provided by the 2005 Ozone Strategy, no significant cumulative adverse impacts are expected.

CUMULATIVE IMPACT MITIGATION FOR CRITERIA POLLUTANTS: The mitigation measures for project specific impacts are provided after each impact discussion above. No additional significant adverse cumulative impacts for criteria pollutants were identified so no further mitigation measures are required.

3.4.5.2 Non-Criteria Pollutants Cumulative Impacts

Implementing the 2005 Ozone Strategy may contribute to new or additional non-criteria pollutant emissions. For example, increases in the use of methylene chloride and perchloroethylene could occur in consumer products because they are specifically exempted by CARB from the ROG definition due to their very low ozone-forming capabilities. There is a potential that the exempt compounds may create air quality impacts if the exempt solvents contain toxic compounds that are not regulated by the State and federal TAC programs. However, these compounds are not exempted from BAAQMD rules and regulations so there is no incentive to use these compounds in the Bay Area.

TCMs that encourage the use of mass transit or increase service by transportation providers that use diesel fuel could result in increased emissions and potentially significant localized TAC emissions of diesel exhaust. On balance, an overall decrease in vehicle miles traveled and air emissions would be anticipated regionally; however, significant air quality impacts associated with diesel exhaust could occur locally. Mitigation measures for these impacts were addressed in the project-specific impact discussions above.

CARB has identified particulate matter from diesel-fuel engines as a toxic air contaminant and is implementing a Risk Reduction Plan (RRP) to reduce particulate matter emissions from diesel-fueled engines and vehicles. The RRP includes: (1) new regulatory standards for all new on-road, off-road, and stationary diesel-fueled engines and vehicles to reduce diesel particulate emissions by about 90 percent; (2) new retrofit requirements for existing on-road, off-road, and stationary diesel-fueled engines and vehicles where determined to be technically feasible and cost effective; and (3) new phase 2 diesel fuel regulations to reduce the sulfur content levels of diesel fuel to no more than 15 ppm to provide the quality of diesel fuel needed by the advanced diesel PM emission controls (CARB, 2000). The projected emission benefits associated with the full implementation of the plan (including proposed federal measures), are reductions in diesel particulate emissions and associated cancer risk of 85 percent by 2010 and 95 percent by 2020. The RRP will have a great impact on reducing the localized risks associated with activities that expose nearby individuals to diesel particulate emissions.

Conclusion: Overall, the 2005 Ozone Strategy will reduce non-criteria pollutants on a regional level. Further, implementation of CARB's Risk Reduction Plan will further reduce localized TAC emissions of diesel exhaust by about 90 percent. Considering the air quality benefits provided by the 2005 Ozone Strategy, no significant cumulative adverse impacts are expected.

CUMULATIVE IMPACT MITIGATION FOR NON-CRITERIA POLLUTANTS: No significant cumulative impacts for non-criteria pollutants were identified so no mitigation measures are required.

3.5 BIOLOGICAL RESOURCES

3.5.1 ENVIRONMENTAL SETTING

The Bay Area supports an extensive diversity of distinct vegetative communities. Broad habitat categories generally include coastal scrubs, oak woodlands, grasslands, estuaries, coastal salt marsh, riparian habitats, and eucalyptus groves, wetlands and rivers and streams. Wetlands, estuaries, rivers and streams, and urban disturbed habitats are not vegetative communities but provide wildlife habitats. The California Department of Fish and Game (CDFG) has identified several specific native vegetative communities as rare and/or sensitive. These natural communities are of special significance because the present rate of loss indicates that further habitat degradation may threaten the viability of plant and wildlife species within the community and hinder the long-term sustainability of the community or species. Natural communities within the Bay Area generally include coastal shrub and chaparral, grasslands, riparian, coastal marsh and estuaries, wetlands, woodlands, eucalyptus grove, and rivers and streams. These communities support a large diversity of wildlife.

The San Francisco Bay and Delta make up the Pacific Coast's largest estuary, encompassing roughly 1,600 miles of waterways and draining over 40 percent of California's fresh water. The Sacramento and San Joaquin Rivers flow from Northern California's inland valleys into the Delta's winding system of islands, sloughs, canals, and channels before emptying into San Francisco Bay and the Pacific Ocean (MTC, 2004). The marine environment supports a wide variety of species including fish, birds and mammals. The United States Fish and Wildlife Service recognizes several threatened and endangered species that occur in San Francisco Bay. These include the Steller sea lion (*Eumetopias jubatus*), the loggerhead sea turtle (*Caretta caretta*), the leatherback turtle (*Dermochelys coriacea*), the olive ridley sea turtle (*lepidochelys olivacea*), and several fish species including coho salmon, steelhead, tidewater goby, delta smelt, Pacific lamprey, and Sacramento splittail. The four later species are native residents; the other species, however, are expected to use open water habitat either seasonally or infrequently (MTC, 2004).

The facilities affected by the proposed stationary source control measures are expected to be located in the commercial and industrial areas within the Bay Area. These commercial/industrial areas have been graded to develop the various structures, and are typically surrounded by other commercial and industrial facilities. Native vegetation, other than landscape vegetation, has usually been removed from these facilities.

3.5.2 SIGNIFICANCE CRITERIA

The impacts on biological resources will be considered significant if any of the following criteria apply:

> The project results in a loss of plant communities or animal habitat considered to be rare, threatened or endangered by federal, state or local agencies.
>
> The project interferes substantially with the movement of any resident or migratory wildlife species.
>
> The project adversely affects aquatic communities.

3.5.3 ENVIRONMENTAL IMPACTS

This subchapter evaluates biological resources impacts that could occur as a consequence of efforts to improve air quality. Table 3.5-1 lists the control measures with potential impacts on biological resources.

TABLE 3.5-1

Control Measures with Potential Biological Resources Impacts

Control Measures	Control Measure Description	Control Methodology	Biological Resources Impact
TCM 7	Improve Ferry Service	Construction of new facilities, use of low emission ferries, and add-on controls	Impacts to sensitive biological resources due to construction of near ferry services and routes

TCM 7 – Improve Ferry Service would result in the construction of new or expanded facilities in the vicinity of the Pittsburg/Antioch, Martinez, Hercules/Rodeo or other terminals. Potential impacts to wetlands, marshlands and aquatic resources could result from dredging operations, construction of facilities or severe erosion from wake wash. These impacts were evaluated in the WTA DEIR (2003) and were considered to remain potentially significant following mitigation. In addition, the WTA DEIR also identified potentially significant impacts associated with the possibility of a ferry striking a whale (although rare) and from noise impacts on wildlife during construction activities.

No other direct or indirect impacts from implementing the control measures within the 2005 Ozone Strategy were identified which could adversely affect biological resources in the Air District. The control measures would primarily result in modifications at existing commercial or industrial facilities to reduce or eliminate existing emissions. Such existing facilities are generally located in appropriately zoned commercial or industrial areas, which typically do not support rare, threatened or endangered species or their habitat. Similarly, modifications at existing facilities would not be expected to interfere substantially with the movement of any native or migratory fish and wildlife species within wildlife corridors, or impede the use of native wildlife nursery sites.

TCM 15 – Local Land Use Planning and Development Strategies would attempt to influence land use patterns and reduce the time and distance traveled between home, jobs, schools, shops and services. TCM 15 would encourage compact, mixed use infill development near transit stations, transit corridors and town centers and discourage urban sprawl into non-urban areas, providing a potential benefit to undeveloped areas and the related biological resources in these areas.

Conclusion: Based on the above evaluation and significance criteria, the impacts on biological resources are expected to be significant to wetlands, marshlands and aquatic resources from dredging operations, construction of facilities or severe erosion from wake wash. In addition, the WTA (2003) DEIR also identified potentially significant impacts associated with the possibility of a ferry striking a whale (although rare) and from noise impacts on wildlife during construction activities.

3.5.4 MITIGATION MEASURES

Biological impacts associated with TCM 7 – Improve Ferry Service were considered potentially significant. The following mitigation measures have been imposed by the Water Transit Authority on this proposed control measure and the mitigation for significant impacts are summarized below (WTA, 2003):

B1 Wetland areas should be delineated on a site-specific basis. Specific wetland boundary determinations shall be used to avoid disturbance of these resources when specific terminal layout plans are defined. For example, parking lot facilities typically the largest part of a terminal footprint, could be located in areas away from the shore and associated wetlands.

B2 In cases where wetland impacts are unavoidable, suitable compensatory mitigation shall be designed within the same subarea and implemented in consultation with appropriate regulatory agencies.

B3 Disturbance of eelgrass beds and mudflats shall be avoided in the design of project features and routing of ferries. Site specific side scan sonar surveys would be required prior to implementation of new routes or construction of new terminals to verify that eelgrass is not present.

B4 As part of the environmental studies and documentation for specific projects, specific areas of eelgrass beds and mudflats that could be impacted shall be specifically determined. In cases where eelgrass is unavoidable, suitable compensatory mitigation shall be designed and implemented in consultation with appropriate regulatory agencies.

B5 Indirect impacts to eelgrass beds from sedimentation shall be avoided or reduced through the use of silt curtains to protect the beds from sedimentation or other methods that would otherwise protect the eelgrass from turbidity plumes generated from dredging.

B6 Ferries shall be equipped with a whale detection system such as forward-looking sonar.

B7 Terminal locations shall be reviewed for potential occurrence of listed species and habitat. Terminal locations and routes should be designed or located to avoid these species. In areas where construction of a terminal could impact a listed species, consultation shall be conducted with appropriate agencies and appropriate permits shall be required.

The biological impacts associated with TCM7 are expected to remain significant following mitigation.

3.5.5 CUMULATIVE BIOLOGICAL IMPACTS

The various control measures and air quality plans with the potential to impact biological impacts are expected to be limited to transportation related projects, the impacts of which were discussed above. Individual project specific impacts from control measure implementation are not expected to result in cumulatively considerable impacts to biological resources. Therefore, cumulative impacts to biological resources are expected to be less than significant. The 2005 Ozone Strategy is expected to improve air quality which would be beneficial to humans as well as plant and animal species in the Air District.

3.6 CULTURAL RESOURCES

3.6.1 ENVIRONMENTAL SETTING

Cultural resources are defined as buildings, sites, structures, or objects that might have historical architectural, archaeological, cultural, or scientific importance.

The Carquinez Strait represents the entry point for the Sacramento and San Joaquin Rivers into the San Francisco Bay. This locality lies within the San Francisco Bay and the west end of the Central Valley archaeological regions, both of which contain a rich array of prehistoric and historical cultural resources. The moderate climate combined

with the abundant natural resources found throughout the Bay Area have supported human habitation for several thousand years. Rising sea levels, the formation of the San Francisco Bay, and the resulting filling of inland valleys have covered these early sites, which were most likely located along the then existing bayshore and waterways. Existing evidence indicates the presence of many village sites from at least 5,000 years ago in the region (MTC, 2004).

Six different groups of native population, identified by their language, lived within the Bay Area, including Coastanoan, Eastern Miwok, Patwin, Coast Miwok, Pomo and Wappo. These native populations increased between 5,000 years ago and the arrival of the Spanish in the later 18th century. Native villages and campsites were inhabited on a temporary basis and are found in several ecological niches due to the seasonal nature of their subsistence base (MTC, 2004). Approximately 7,000 Native American and historic cultural resources have been recorded in the Bay Area and are listed with the Historical Resources Information System. About 1,373 cultural resources are listed on the National Register of Historic Places, of which approximately 240 are designated California Historic Landmarks. The California Inventory of Historic Resources includes a total of about 820 historic buildings, sites, or objects and 2,340 archaeological sites. The greatest concentration of listed historic resources occurs in San Francisco with 215 sites on the National Register. Alameda County has the second highest number of listed historic resources with 159 (MTC, 2004).

Dense concentrations of the Native American archaeological sites occur along the historic margins of San Francisco and San Pablo Bays. Archaeological sites have also been identified in the following environmental settings in all Bay Area counties: along historic bayshore margins, near sources of water (such as vernal pools and springs), along ridgetops, and on midslope terraces, and at the base of hills and on alluvial flats (MTC, 2004).

3.6.2 SIGNIFICANCE CRITERIA

Impacts to cultural resources will be considered significant if:

> The project results in the disturbance of a significant prehistoric or historic archaeological site or a property of historic or cultural significance to a community or ethnic or social group.
>
> Unique paleontological resources are present that could be disturbed by construction of the proposed project.
>
> The project would disturb human remains.

The CEQA Guidelines define a significant cultural resources as a “resource listed or eligible for listing on the California Register of Historical Resources” (Public Resources Code Section 5024.1). A project would have a significant impact if it would cause a

substantial adverse change in the significance of a historical resource (CEQA Guidelines Section 15064.5(b)).

3.6.3 ENVIRONMENTAL IMPACTS

This subchapter evaluates cultural resources impacts that could occur as a consequence of efforts to improve air quality. Table 3.6-1 lists the control measures with potential impacts on biological resources.

TABLE 3.6-1

Control Measures with Potential Cultural Resources Impacts

Control Measures	Control Measure Description	Control Methodology	Cultural Resources Impact
TCM 4	Upgrade and Expand Local and Regional Rail Service	Construction of additional rail facilities, electrification of rail services	Construction of new rail facilities could impact cultural resources
TCM 6	Improve Interregional Rail Service	Construction of new rail facilities	Construction of new rail lines could impact cultural resources
TCM 7	Improve Ferry Service	Construction of new facilities, use of low emission ferries, and add-on controls	Construction of new ferry facilities could impact cultural resources
TCM 8	Construct Carpool/Express Bus Lanes on Freeways	Construction of new High Occ-upancy Vehicle (HOV) lanes	Construction of new freeway lanes could impact cultural resources

Implementing the proposed 2005 Ozone Strategy is primarily expected to result in controlling stationary source emissions at existing commercial or industrial facilities, providing incentives to control for mobile source emissions, or establishing transportation improvement projects. Affected facilities are typically located in appropriately zoned commercial or industrial areas or transportation corridors that have previously been disturbed.

In a small number of cases, implementing stationary source control measures in the proposed 2005 Ozone Strategy may require minor site preparation and grading at an affected facility. Under this circumstance, it is possible that archaeological or paleontological resources could be uncovered. Even if this circumstance were to occur, significant adverse cultural resource impacts are not anticipated because there are existing laws in place that are designed to protect and mitigate potential adverse impacts to cultural resources. As with any construction activity, should archaeological resources be found during construction that results from implementing the proposed BAAQMD control measures, the activity would cease until a thorough archaeological assessment is conducted.

Some of the transportation control measures may require more substantial construction activities and potentially disturb cultural resources. TCM 7 – Improve Ferry Service

would require dredging of new channels or pier retrofit or installation that could impact submerged, sub-bottom and previously unknown cultural resources in San Francisco Bay near the Hercules/Rodeo terminal location. TCM 4 – Upgrade and Expand Local and Regional Rail Service, TCM 6 – Improve Interregional Rail Service, and TCM 8 – Construct Carpool/Express Bus Lanes on Freeways could result in construction of new terminals, railways, and freeway lanes and potentially impact previously unknown cultural resources.

Conclusion: Because the stationary sources potentially affected are existing facilities, and controlling stationary source emissions does not typically require extensive cut-and-fill activities, or excavation, it is unlikely that implementing stationary source control measures in the proposed 2005 Ozone Strategy will: (1) adversely affect historical or archaeological resources as defined in CEQA Guidelines §15064.5; (2) destroy unique paleontological resources or unique geologic features; or (3) disturb human remains interred outside formal cemeteries. However, implementation of TCMs 4, 6, 7 and 8 could adversely impact previously unknown historical, archaeological or paleontological resources and, therefore, could result in significant impacts.

3.6.4 MITIGATION MEASURES

The EIR for the Expansion of Ferry Transit Service in San Francisco Bay (TCM 7) included mitigation measures to reduce the potential impacts on cultural resources. Such mitigation includes detailed cultural surveys prior to construction activities, avoiding archaeological sites, preservation of the resources and so forth. The impacts were considered to remain significant following mitigation as construction could impact known or unknown cultural resources (WTA, 2003).

The following mitigation measures are required to minimize the potential significant impacts on cultural resources associated with TCM 7 construction activities:

CR1 Cultural surveys shall be required prior to construction activities associated with new transportation facilities in areas where cultural resources may be expected.

CR2 When possible, development near or on cultural resources will be avoided.

CR3 Where cultural resources cannot be avoided, a qualified paleontologist/ archaeologist monitor will conduct full-time monitoring of construction activities in areas that are likely to contain paleontologic resources. In areas identified with a moderate to low potential to contain fossils, monitoring time will be reduced until fossil remains are discovered, at which time monitoring will then be increased to full-time.

CR4 A qualified archaeologist shall monitor ground disturbing activities in native soils/sediments, as well as the initial stages of grading of the property. In the event that archaeological resources are discovered during construction, the monitor will have the authority to temporarily halt or divert construction in the

immediate vicinity of the discovery while it is evaluated for significance. Construction activities could continue in other areas. If the discovery proves to be significant, additional investigation, such as evaluation and data recovery excavation may be warranted.

CR5 A qualified paleontologist will be retained to supervise monitoring of construction excavations and to produce a mitigation plan in areas of cultural resource sensitivities. Paleontological monitoring will include inspection of exposed rock units and microscopic examination of matrix to determine if fossils are present. The paleontologist will have authority to temporarily divert grading away from fossil remains.

CR6 If microfossils are present, the monitor will collect matrix for processing. In order to expedite removal of fossiliferous matrix, the monitor may request heavy machinery assistance to move large quantities of matrix out of the path of construction to designated stockpile areas. Testing of stockpiles will consist of screen washing small samples (approximately 200 pounds) to determine if significant fossils are present. Productive tests will result in screen washing of additional matrix from the stockpiles to a maximum of 6,000 pounds per locality to ensure recovery of a scientifically significant sample.

CR7 Recovered fossils will be prepared to the point of curation, identified by qualified experts, listed in a database to facilitate analysis and reposited in a designated paleontological curation facility.

CR8 At each fossil locality, field data forms will record the locality, strategraphic sections will be measured, and appropriate scientific samples collected and submitted for analysis.

CR9 The qualified paleontologist will prepare a final mitigation report to be filed with the lead agency and the repository.

The above mitigation measures are expected to reduce the potential impacts on cultural resources associated with construction activities. Until final locations and designs are known for some of the transportation control measures, the impact on unknown cultural resources cannot be determined and this remains a potentially significant impact.

3.6.5 CUMULATIVE IMPACTS ON CULTURAL RESOURCES

The various control measures contained within the 2005 Ozone Strategy and other air quality plans with the potential to impact cultural resources are expected to be limited to transportation related projects, the impacts of which were discussed above. No additional cumulative impacts, other than the project specific impacts discussed above are expected. Improving air quality could provide benefits to historic buildings within the Bay Area by minimizing exposure to chemicals that could result in building deterioration.

3.7 GEOLOGY AND SOILS

3.7.1 ENVIRONMENTAL SETTING

The Bay Area is located in the Coast Range geomorphic province, with portions of Contra Costa and Solano Counties extending into the Great Valley geomorphic province. The Coast Range extends about 400 miles along the Pacific Coast, from Oregon into southern California. The province is characterized by a series of northwest trending ridges and valleys controlled by tectonic folding and faulting and generally characterize the geologic setting of the San Francisco Bay region, examples of which include the Suisun Bay, East Bay Hills, Briones Hills, Vaca Mountains, Napa Valley, and Diablo Ranges.

Regional basement rocks consist of the highly deformed Great Valley Sequence, which include massive beds of sandstone interfingered with siltstone and shale. Unconsolidated alluvial deposits, artificial fill, and estuarine deposits, (including Bay Mud) underlie the low-lying region along the margins of the Carquinez Straight and Suisun Bay. The estuarine sediments found along the shorelines of Solano County are soft, water-saturated mud, peat and loose sands. The organic, soft, clay-rich sediments along the San Francisco and San Pablo Bays are referred to locally as Bay Mud and can present a variety of engineering challenges due to inherent low strength, compressibility and saturated conditions. Landslides in the region occur in weak, easily weathered bedrock on relatively steep slopes.

The San Francisco Bay Area is a seismically active region, which is situated on a plate boundary marked by the San Andreas Fault System. Several northwest trending active and potentially active faults are included with this fault system. Under the Alquist-Priolo Earthquake Fault Zoning Act, Earthquake Fault Zones were established by the California Division of Mines and Geology along “active” faults, or faults along which surface rupture occurred in Holocene time (the last 11,000 years). In the Bay area, these faults include the San Andreas, Hayward, Calaveras, Rodgers Creek-Healdsburg, Concord-Green Valley, Greenville-Marsh Creek, Seal Cove-San Gregorio and West Napa faults (Figure 3.7-1). Other smaller faults in the region classified as potentially active include the Southampton and Franklin faults. The San Andreas and the Hayward faults are the two main active, strike-slip faults in the Bay Area and have experienced movements within the last 150 years. The San Andreas fault is a major structural feature in the region and forms a boundary between the North American and Pacific tectonic plates. Recent earthquakes over 5.0 magnitude are included in Table 3.7-1.

Ground movement intensity during an earthquake can vary depending on the overall magnitude, distance to the fault, focus of earthquake energy, and type of geological material. Areas that are underlain by bedrock tend to experience less ground shaking than those underlain by unconsolidated sediments such as artificial fill. Earthquake

ground shaking may have secondary effects on certain foundation materials, including liquefaction, seismically induced settlement, and lateral spreading.

Liquefaction is a phenomenon whereby unconsolidated and/or near saturated soils lose cohesion and are converted to a fluid state as a result of severe vibration (e.g., earthquake). The relatively rapid loss of soil shear strength during strong earthquake shaking results in the temporary fluid-like behavior of the soil. Soil liquefaction causes ground failure that can damage homes, buildings, roads, pipelines, etc. Liquefaction can occur in areas characterized by water-saturated, cohesionless, granular materials at depths less than 40 feet. In addition, liquefaction can occur in areas with unconsolidated or artificial fill sediments such as those located in reclaimed areas along the margin of the San Francisco Bay. Liquefaction potential is highest in areas underlain by Bay fills, Bay Mud, and unconsolidated alluvium.

TABLE 3.7-1

EARTHQUAKES IN THE BAY AREA OVER 5.0 MAGNITUDE SINCE 1960

YEAR	LOCATION (epicenter)	MAGNITUDE
1960	West of Cape Mendocino	6.2
1980	Livermore	5.8
1984	Morgan Hill	6.1
1984	Mendocino Fracture Zone	6.7
1989	Loma Prieta	7.1
1992	Cape Mendocino	7.2
1992	Cape Mendocino	6.5
1992	Cape Mendocino	6.6
1994	Mendocino Fracture Zone	6.9
2000	Mendocino Fracture Zone	5.9

Source: California Division of Mines and Geology, 2004

Tsunamis are tidal waves or period waves that are caused by underwater seismic disturbances, volcanic eruptions, or submerged landslides. Tsunamis affecting the Bay Area would most likely originate west of the Bay, within the Pacific Rim. During the period between 1854 and 1964, approximately 21 tsunamis were recorded at the Fort Point tide gauge in San Francisco. The largest wave height recorded was 7.4 feet resulting from the 1964 Alaska earthquake. It is estimated that a tsunami with a wave height or run up to 20 feet could pass through the Golden Gate every 200 years. A ten-foot wave is estimated to occur every 90 years. Areas that are highly susceptible to tsunami inundation tend to be located in low-lying coastal areas such as tidal flats, marshlands, and former bay margins that have been artificially filled (MTC, 2004).

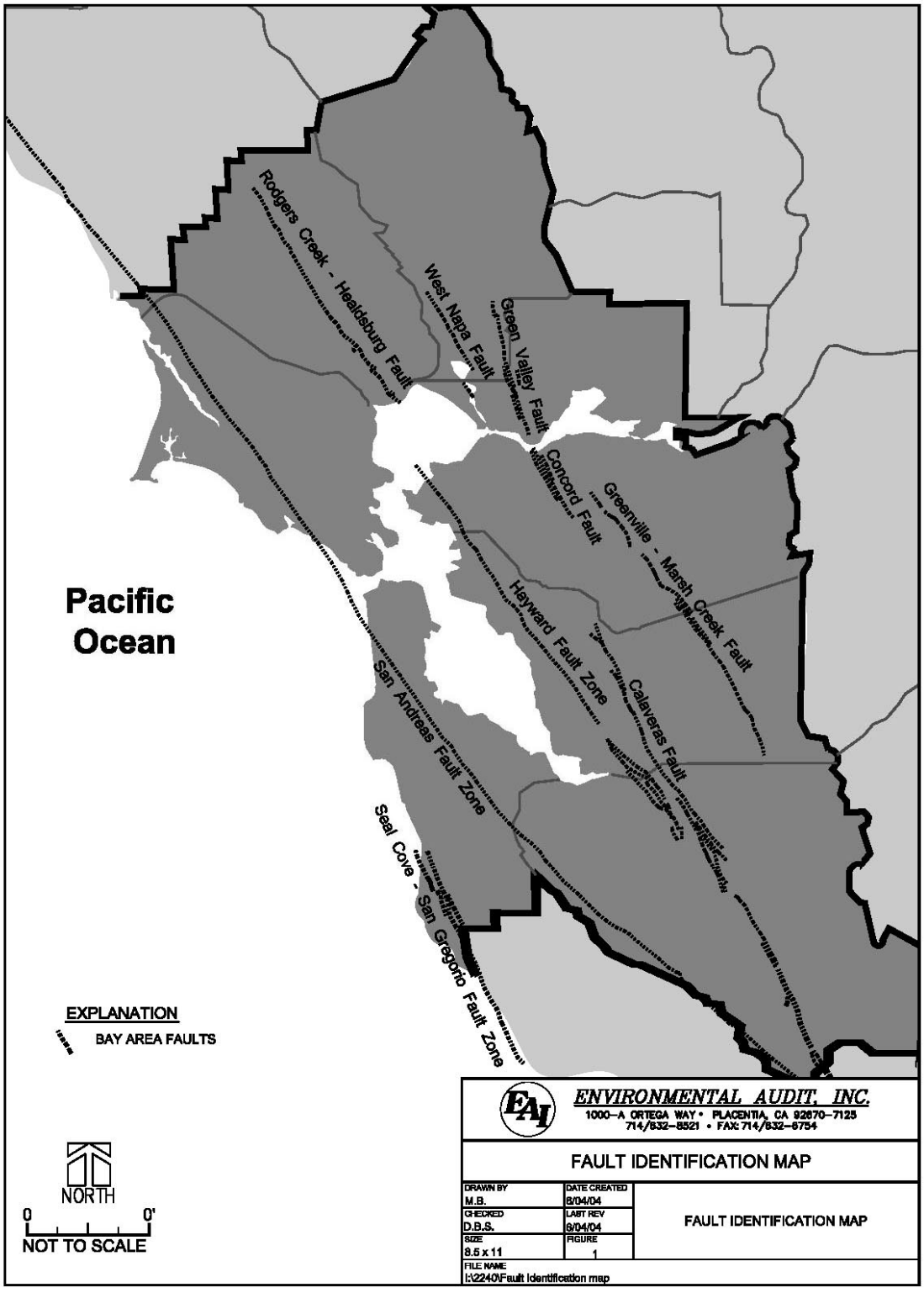

FIGURE 3.7-1
Fault Identification Map

3.7.2 SIGNIFICANCE CRITERIA

The impacts on the geological environment will be considered significant if any of the following criteria apply:

Topographic alterations would result in significant changes, disruptions, displacement, excavation, compaction or over covering of large amounts of soil.

Unique geological resources (paleontological resources or unique outcrops) are present that could be disturbed by the construction of the proposed project.

Exposure of people or structures to major geologic hazards such as earthquake surface rupture, ground shaking, liquefaction or landslides.

Secondary seismic effects could occur which could damage facility structures, e.g., liquefaction.

Other geological hazards exist which could adversely affect the facility, e.g., landslides, mudslides.

3.7.3 ENVIRONMENTAL IMPACTS

This subchapter evaluates impacts on geology and soil that could occur as a consequence of efforts to improve air quality. No control measures were identified that are expected to result in impacts to geological impacts. However, all control measures that require construction of new facilities could potentially have geological hazards and are addressed below.

The proposed 2005 Ozone Strategy will not directly expose people or structures to earthquake faults, seismic shaking, seismic-related ground failure including liquefaction, landslides, mudslides or substantial soil erosion for the following reasons: When implemented as rules or regulations, BAAQMD control measures do not directly or indirectly result in construction of new structures. Some structural modifications, however, at existing affected facilities may occur as a result of installing control equipment or making process modifications. In any event, existing affected facilities or modifications to existing facilities would be required to comply with relevant Uniform Building Code requirements in effect at the time of initial construction or modification of a structure.

New structures must be designed to comply with the Uniform Building Code Zone 4 requirements since the Air District is located in a seismically active area. The local cities or counties are responsible for assuring that projects comply with the Uniform Building Code as part of the issuance of the building permits and can conduct inspections to ensure compliance. The Uniform Building Code is considered to be a standard safeguard against major structural failures and loss of life. The goal of the Code is to provide structures

that will: (1) resist minor earthquakes without damage; (2) resist moderate earthquakes without structural damage but with some non-structural damage; and (3) resist major earthquakes without collapse but with some structural and non-structural damage. The Uniform Building Code bases seismic design on minimum lateral seismic forces ("ground shaking"). The Uniform Building Code requirements operate on the principle that providing appropriate foundations, among other aspects, helps to protect buildings from failure during earthquakes. The basic formulas used for the Uniform Building Code seismic design require determination of the seismic zone and site coefficient, which represents the foundation conditions at the site.

Any potentially affected facilities that are located in areas where there has been historic occurrence of liquefaction, e.g., coastal zones, or existing conditions indicate a potential for liquefaction, including expansive or unconsolidated granular soils and a high water table, may have the potential for liquefaction induced impacts at the project sites. The Uniform Building Code requirements consider liquefaction potential and establish more stringent requirements for building foundations in areas potentially subject to liquefaction. Therefore, compliance with the Uniform Building Code requirements is expected to minimize the potential impacts associated with liquefaction. The issuance of building permits from the local cities or counties will assure compliance with the Uniform Building Code requirements. Therefore, no significant impacts from liquefaction are expected.

Because facilities affected by any BAAQMD control measures are typically located in industrial or commercial areas, which are not typically located near known geological hazards (e.g., landslide, mudflow, seiche, tsunami or volcanic hazards), no significant adverse geological impacts are expected.

Although the proposed 2005 Ozone Strategy control measures may require modifications at existing industrial or commercial facilities, such modifications are not expected to require substantial grading or construction activities. Construction would be expected for some of the transportation control measures for ferry service, rail service and to construct carpool or bus lanes. The proposed control measures do not have the potential to substantially increase the area subject to compaction or overcovering since the subject areas would be limited in size and, typically, have already been graded or displaced in some way. Therefore, significant adverse soil erosion impacts are not anticipated from implementing the 2005 Ozone Strategy.

The CEQA environmental checklist includes a discussion of septic tanks and alternative wastewater disposal systems within the discussion of Geology and Soils. Therefore, a discussion of septic tanks and alternative septic systems is included herein for completeness. Septic tanks or other similar alternative wastewater disposal systems are typically associated with small residential projects in remote areas. The proposed 2005 Ozone Strategy does not contain any control measures that generate construction of residential projects in remote areas. BAAQMD control measures typically affect existing industrial or commercial facilities, which already are hooked up to appropriate sewerage

facilities so no impacts on septic tanks or alternative wastewater disposal systems are expected.

Conclusion: Based on the above evaluation and significance criteria, the impacts on geological resources associated with implementation of the 2005 Ozone Strategy are expected to be less than significant.

3.7.4 MITIGATION MEASURES

No significant adverse impacts on geology and soils are expected so no mitigation measures are required.

3.7.5 CUMULATIVE GEOLOGY AND SOILS IMPACTS

The cumulative impacts are essentially the same as the direct impacts outlined above. The projected increase in population in the Bay Area will result in increased risk of exposure of people and property to the potentially damaging effects of strong seismic shaking, fault rupture, seismically induced ground failure and slope instability. The potential for structural failures, injuries and loss of life would be greatest on raised structures, on earthquake susceptible soils and within fault zones. These issues are related to population growth and not to air quality plans, rules or regulations. Therefore, no significant cumulative impacts on geology and soils are expected.

3.8 HAZARDS AND HAZARDOUS MATERIALS

3.8.1 ENVIRONMENTAL SETTING

The goal of the 2005 Ozone Strategy is to attain and maintain the State one-hour ozone standard, thus improving air quality and protecting public health. Some of the proposed control measures intended to improve overall air quality may, however, have direct or indirect hazards associated with their implementation. Hazard concerns are related to the potential for fires, explosions or the release of hazardous substances in the event of an accident or upset conditions.

The potential hazards associated with industrial activities are a function of the materials being processed, processing systems, and procedures used to operate and maintain the facility. The hazards that are likely to exist are identified by the physical and chemical properties of the materials being handled and their process conditions, including the following events:

- **Toxic gas clouds:** Toxic gas clouds are releases of volatile chemicals (e.g., anhydrous ammonia, chlorine, and hydrogen sulfide) that could form a cloud and migrate off-site, thus exposing individuals. "Worst-case" conditions tend to arise when very low wind speeds coincide with an accidental release, which can allow the chemicals to accumulate rather than disperse.

- **Torch fires (gas and liquefied gas releases), flash fires (liquefied gas releases), pool fires, and vapor cloud explosions (gas and liquefied gas releases):** The rupture of a storage tank or vessel containing a flammable gaseous material (like propane), without immediate ignition, can result in a vapor cloud explosion. The "worst-case" upset would be a release that produces a large aerosol cloud with flammable properties. If the flammable cloud does not ignite after dispersion, the cloud would simply dissipate. If the flammable cloud were to ignite during the release, a flash fire or vapor cloud explosion could occur. If the flammable cloud were to ignite immediately upon release, a torch fire would ensue.

- **Thermal Radiation:** Thermal radiation is the heat generated by a fire and the potential impacts associated with exposure. Exposure to thermal radiation would result in burns, the severity of which would depend on the intensity of the fire, the duration of exposure, and the distance of an individual to the fire.

- **Explosion/Overpressure:** Process vessels containing flammable explosive vapors and potential ignition sources are present at refineries. Explosions may occur if the flammable/explosive vapors came into contact with an ignition source. An explosion could cause impacts to individuals and structures in the area due to overpressure.

3.8.1.1 Hazardous Materials Incidents

The California Hazardous Materials Incident Reporting System (CHMIRS) is a post incident reporting system to collect data on incidents involving the accidental release of hazardous materials. Information on accidental releases of hazardous materials are reported to and maintained by OES. In 2001, there were a total of 1,398 incidents reported in the nine counties regulated by the BAAQMD (see Table 3.8-1). The statistical information is from a widely distributed cross section of sources in California. These data may not accurately represent the actual occurrences of incidents throughout the state because of differences in population, non-uniform distribution of commercial and industrial facilities, and differences in resources between participating agencies statewide.

TABLE 3.8-1

Hazardous Materials Incidents 2001 by County

COUNTY	REPORTED INCIDENTS
Alameda	307
Contra Costa	372
Marin	72
Napa	33
San Francisco	97
San Mateo	133
Santa Clara	128
Solano	143
Sonoma	113
Total No. of Incidents	1,398

Source: Governor's Office of Emergency Services, 2001

The location of the spills varies (see Table 3.8-2). In the nine counties that comprise the Air District the major portion of the spills occurred during transportation or at transportation facilities. Incidents at utilities, at unknown locations and at industrial facilities were the most common locations, respectively, for hazardous materials incidents. About 15.5 percent of the hazardous materials incidents that occurred during transportation activities occurred within the nine counties that comprise the Bay Area.

TABLE 3.8-2

Hazardous Materials Incidents 2001

Spillsite	BAAQMD	Statewide	Percent of State Total
Transportation	604	3,104	19.5
Industrial	211	1,045	20.2
Commercial	142	818	17.4
Military	6	98	17.9
Residential	119	892	13.3
Waterways	129	505	6.1
Utilities	53	206	25.5
Other	135	756	25.2
Unknown	0	1,594	0
Total	**1,398**	**9,018**	**15.5**

Source: Governor's Office of Emergency Services, 2001

3.8.2 SIGNIFICANCE CRITERIA

The impacts associated with hazards will be considered significant if any of the following occur:

> Non-conformance to regulations or generally accepted industry practices related to operating policy and procedures concerning the design, construction, security, leak detection, spill containment or fire protection.
>
> Exposure to hazardous chemicals in concentrations equal to or greater than the Emergency Response Planning Guideline (ERPG) 2 levels.

3.8.3 ENVIRONMENTAL IMPACTS

Table 3.8-3 lists the control measures associated with the 2005 Ozone Strategy with potential hazard impacts. The potential hazard impacts include hazards associated with the reformulation of coatings, ammonia use in selective catalytic reduction (SCR) units, use of fuel additives and alternative fuels. SS 6 - Flares was adopted by the Board of Directors on July 20, 2005, as Regulation 12: Rule 12: Flares. An environmental impact report was prepared for this rule development which concluded that potential hazards associated with regulating flare operations would be less than significant (BAAQMD 2005).

Reformulated Coatings

The 2005 Ozone Strategy includes control measures that could require reformulation of coatings and solvent to regulate VOC emissions by establishing VOC content requirements for products such as coatings and solvents. These control measures include SS 1 – Auto Refinishing, SS 2 – Graphic Arts Operations, SS 3 – High Emitting Spray Booths, SS 4 – Polyester Resin Operations, and SS 5 – Wood Products Coating, and may result in reformulating these products with materials that have a low content or contain exempt VOC materials. It is expected that future VOC content limits required for coatings and consumer products can be achieved, in part, through the use of coatings and products reformulated with acetone exempt solvents and water based solvents. Acetone is an exempt compound from air quality rules and regulations because of its low reactivity. With regard to possible replacement solvents, CARB indicates that the trend in coatings technology is to replace solvents with less toxic/less hazardous coalescing solvents (Yolo-Solano AQMD, 2001). Additionally, CARB staff indicates that a majority of water-based formulations do not contain solvents that are hazardous air pollutants (Yolo-Solano AQMD, 2001).

TABLE 3.8-3

Control Measures with Potential Hazard Impacts

Control Measures	Control Measure Description	Control Methodology	Impact
SS 1	Auto Refinishing	Reformulated low-VOC coatings/solvents	Potential exposure to glycol ethers; flammability of acetone
SS 2	Graphic Arts Operations	Reformulated low-VOC coatings/solvents	Potential exposure to glycol ethers; flammability of acetone
SS 3	High Emitting Spray Booths	Reformulated low-VOC coatings/solvents, add on control devices	Potential exposure to glycol ethers; flammability of acetone
SS 4	Polyester Resin Operations	Reformulated low-VOC coatings/solvents	Potential exposure to glycol ethers; flammability of acetone
SS 5	Wood Products Coating	Reformulated low-VOC coatings/solvents	Potential exposure to glycol ethers; flammability of acetone
SS 14	Stationary Gas Turbines	Add-on control equipment	SCR to control NOx could result in hazard impacts associated with ammonia
MS 3	Low Emission Vehicle Incentives	Purchase low or zero-emission vehicles or engines, engine repowers, retrofits & replacements; add-on control equipment; clean fuels or additives; and use of alternative fuels	Potential fuel additives can be hazardous. The use of fuel additives is federally regulated and requires evaluation of health effects prior to approval. May promote the use of alternative fuels particularly compressed natural gas
TCM 7	Improve Ferry Service	Construction of new facilities, use of low emission ferries, and add-on controls	Increase in use of alternative fuels (hydrogen)

To the extent that hazardous materials are used to replace higher VOC-containing materials, it is conceivable that implementing these control measures could create hazard impacts. In addition, these materials could be accidentally released into the environment.

As shown in Table 3.8-4, the flammability classifications by the National Fire Protection Association (NFPA) are the same for acetone, t-butyl acetate, toluene, xylene, MEK, isopropanol, butyl acetate, and isobutyl alcohol. Recognizing that as a "worst-case," acetone has the lowest flash point, it still has the highest Lower Explosive Limit, which means that acetone vapors will not cause an explosion unless the vapor concentration exceeds 26,000 ppm. Under operating guidelines of working with flammable coatings under well-ventilated areas, as prescribed by the fire department codes, it would be difficult to achieve concentrated streams of such vapors (SCAQMD, 2003).

TABLE 3.8-4
Chemical Characteristics for Common Coating Solvents

Chemical Compounds	Flashpoint (^{o}F)	Lower Explosive Limit (% by Vol.)	Flammability Classification (NFPA)
Toluene	40	1.3	Serious
Xylene	90	1.1	Serious
MEK	21	2.0	Serious
Isopropanol	53	2.0	Serious
Butyl Acetate	72	1.7	Serious
Isobutyl Alcohol	82	1.2	Serious
Stoddard Solvent	140	0.8	Moderate
Petroleum Distillates (Naptha)	105	1.0	Severe
EGBE	141	1.1	Moderate
EGME	107	2.5	Moderate
EGEE	120	1.8	Moderate
Acetone	1.4	2.6	Serious
Di-Propyl Glycol	279	1	Slight
Propylene Glycol	210	2.6	Slight
Ethylene Glycol	232	3.2	Slight
Texanol	248	0.62	Slight
Oxsol 100	109	0.90	Slight
t-Butyl Acetate	59	1.5	Serious
Hexamethylene Diisocyanate	284	1	Slight
Methylene Bisphenyl Diisocyanate	385	1	Slight
Toluene Diisocyanate	270	1	Slight

Source: SCAQMD, 2003

As a "worst-case" assumption, it is assumed most affected coating categories would be reformulated with acetone to meet the interim and final VOC content limits. The labels and MSDSs accompanying acetone-based products caution the user regarding acetone's flammability and advise the user to "keep the container away from heat, sparks, flame and all other sources of ignition." All of the large coating manufacturers currently offer pure acetone for sale in quart or gallon containers with similar warnings.

The fire departments regulate spray application of flammable or combustible liquids. They require no open flame, spark-producing equipment or exposed surfaces exceeding the ignition temperature of the material being sprayed within the area. For open spraying, as would be the case for the field application of the acetone-based coatings, no spark-producing equipment or open flame shall be within 20 feet horizontally and 10 feet vertically of the spray area. Anyone not complying with the guidelines would be in violation of the current fire codes. The fire departments limit residential storage of flammable liquids to five gallons and recommends storage in a cool place. If the flammable coating container will be exposed to direct sunlight or heat, storage in cool

water is recommended. Finally, all metal containers involving the transfer of five gallons or more should be grounded and bonded (SCAQMD, 2003).

Conclusion: Based upon the above considerations, hazard impacts and impacts to fire departments are expected be less than significant. Similarly, any increase in future compliant coating materials would be expected to result in a concurrent reduction in the number of accidental releases of coating materials. As a result, the net number of accidental releases would be expected to remain constant. Furthermore, if manufacturers use solvents such as Texanol, propylene glycol, etc., in future compliant water-borne coatings, no significant adverse hazard impacts would be expected to occur, because in general, these solvents are less flammable solvents as rated by the NFPA (SCAQMD, 2003).

Ammonia Use in SCRs

Proposed control measure SS 14 – Stationary Gas Turbines would require or encourage the use of SCR to reduce NOx emissions. Ammonia or urea is used to react with the NOx, in the presence of a catalyst, to form nitrogen gas and water. In some SCR installations, anhydrous ammonia is used. Safety hazards related to the transport, storage and handling of ammonia exist. Ammonia has acute and chronic non-cancer health effects and also contributes to ambient PM10 emissions under some circumstances.

On-Site Release Scenario: The use of anhydrous ammonia involves greater risk than aqueous ammonia because it is stored and transported under pressure. In the event of a leak or rupture of a tank, anhydrous ammonia is released and vaporizes into the gaseous form, which is its normal state at atmospheric pressure and produces a toxic cloud. Aqueous ammonia is a liquid at ambient temperatures and gas is only produced when a liquid pool from a spill evaporates. Under current OES regulations implementing the CalARP requirements, aqueous ammonia is regulated under California Health and Safety Code Section 2770.1.

Some of the control measures would require the increased use and storage of ammonia. Stationary gas turbines that would likely use SCRs would be industrial and commercial facilities, located in industrial/commercial zones. However, the use and storage of anhydrous ammonia would be expected to result in significant hazard impacts as there is the potential for anhydrous ammonia to migrate off-site and expose individuals to concentrations of ammonia that could lead to adverse health impacts. Anhydrous ammonia would be expected to form a vapor cloud (since anhydrous ammonia is a gas at standard temperature and pressures) and migrate from the point of release. The number of people exposed and the distance that the cloud would travel would depend on the meteorological conditions present. Depending on the location of the spill, a number of individuals could be exposed to high concentrations of ammonia resulting in potentially significant impacts.

In the event of an aqueous ammonia release, the ammonia solution would have to pool and spread out over a flat surface in order to create sufficient evaporation to produce a significant vapor cloud. For a release from on-site vessels or storage tanks, spills would

be released into a containment area, which would limit the surface area of the spill and the subsequent toxic emissions. The containment area would limit the potential pool size, minimizing the amount of spilled material that would evaporate, form a vapor cloud, and impact residences or other sensitive receptors in the area of the spill. Significant hazard impacts associated with a release of aqueous ammonia would not be expected.

Transportation Release Scenario: Use and transport of anhydrous ammonia involves greater risk than aqueous ammonia because it is stored and transported under pressure. In the event of a leak or rupture of a tank, anhydrous ammonia is released and vaporizes into the gaseous form, which is its normal state at atmospheric temperature and pressure, and produces a toxic cloud. Aqueous ammonia is a liquid at ambient temperatures and pressure, and gas is only produced when a liquid pool from a spill evaporates. Deliveries of ammonia would be made to each facility by tanker truck via public roads. The maximum capacity of a tanker truck is 150 barrels. Regulations for the transport of hazardous materials by public highway are described in 49 CFR 173 and 177. Nineteen percent aqueous ammonia is considered a hazardous material under 49 CFR 172.

Although trucking of ammonia and other hazardous materials is regulated for safety by the U.S. DOT, there is a possibility that a tanker truck could be involved in an accident spilling its contents. The factors that enter into accident statistics include distance traveled and type of vehicle or transportation system. Factors affecting automobiles and truck transportation accidents include the type of roadway, presence of road hazards, vehicle type, maintenance and physical condition, and driver training. A common reference frequently used in measuring risk of an accident is the number of accidents per million miles traveled. Complicating the assessment of risk is the fact that some accidents can cause significant damage without injury or fatality.

The actual occurrence of an accidental release of a hazardous material cannot be predicted. The location of an accident or whether sensitive populations would be present in the immediate vicinity also cannot be identified. In general, the shortest and most direct route that takes the least amount of time would have the least risk of an accident. Hazardous material transporters do not routinely avoid populated areas along their routes, although they generally use approved truck routes that take population densities and sensitive populations into account.

The hazards associated with the transport of regulated (CCR Title 19, Division 2, Chapter 4.5 or the CalARP requirements) hazardous materials, including ammonia, would include the potential exposure of numerous individuals in the event of an accident that would lead to a spill. Factors such as amount transported, wind speed, ambient temperatures, route traveled, distance to sensitive receptors are considered when determining the consequence of a hazardous material spill.

In the unlikely event that the tanker truck would rupture and release the entire 150 barrels of aqueous ammonia, the ammonia solution would have to pool and spread out over a flat surface in order to create sufficient evaporation to produce a significant vapor cloud. For a road accident, the roads are usually graded and channeled to prevent water

accumulation and a spill would be channeled to a low spot or drainage system, which would limit the surface area of the spill and the subsequent toxic emissions. Additionally, the roadside surfaces may not be paved and may absorb some of the spill. Without this pooling effect on an impervious surface, the spilled ammonia would not evaporate into a toxic cloud and impact residences or other sensitive receptors in the area of the spill. An accidental aqueous ammonia spill occurring during transport is, therefore, not expected to have significant impacts.

In the unlikely event that a tanker truck would rupture and release the entire contents of anhydrous ammonia, the ammonia would be expected to form a vapor cloud (since anhydrous ammonia is a gas at standard temperature and pressures) and migrate from the point of release. There are federal, State and local agencies with jurisdiction over hazardous materials and waste are responsible for ensuring that hazardous materials and waste handling activities are conducted in accordance with applicable laws and regulations. While compliance with these laws and regulations will minimize the chance of an accidental release of anhydrous ammonia, the potential will still exist that an unplanned release could occur. The number of people exposed and the distance that the cloud would travel would depend on the meteorological conditions present. Depending on the location of the spill, a number of individuals could be exposed to high concentrations of ammonia resulting in potentially significant impacts.

Conclusion: Based on the above evaluation and significance criteria, the hazard impacts associated with the use and transport of aqueous ammonia are less than significant. The hazard impacts associated with the use and transport of anhydrous ammonia are potentially significant.

Use of Fuel Additives

Mobile Source Control Measure MS 3 - Low Emission Vehicles, would encourage the use of fuel additives to provide emission reductions. In the past, the introduction of fuel additives into gasoline has resulted in environmental impacts, e.g., lead and MTBE. Before proposing rules requiring fuel additives, federal regulations require that the additives be evaluated for their toxic effects. The additives need to be evaluated for their potential health impacts associated with exposure, secondary air impacts (including generation of toxic air contaminants), hazard impacts, impacts on water quality, and any other potential environmental impacts that could occur. These studies are required prior to approving the additives to be used in any fuel and require that the benefits of the additive (e.g., emission reductions) outweigh any of the negative impacts associated with the additive.

Conclusion: Because of these requirements, the potential impacts of fuel additives are less than significant because negative impacts would be identified and mitigated, as necessary, prior to their use.

Alternative Fuels

Control Measures MS 3 – Low Emission Vehicles, and TCM 7- Improve Ferry Service, would establish incentive programs and in-use strategies requiring or promoting the use of alternative clean fuel, particularly compressed natural gas. Compressed natural gas (CNG) is a flammable material and increased use of natural gas could result in increased hazards associated with the transport and use of natural gas, particularly in mobile sources.

Natural gas is mainly methane, which is a mixture of hydrocarbons that are in gaseous form at ambient temperature and pressure. Natural gas can be compressed to increase its density, and in compressed form it contains a high enough fuel value that it can be used as a fuel for motor vehicles. Typical on-board pressures for CNG range from 3,000 to 3,600 pounds per square inch gauge (psig).

Compared with diesel fuel and gasoline the following can be stated:

- Diesel fuel and gasoline are toxic to the skin and lungs and CNG is not;
- Diesel fuel and gasoline vapors are heavier than air (for specific gravity of air =1, gasoline is 3.4 and diesel fuel is >4). CNG is lighter than air (specific gravity is 0.55) and disperses more readily in air;
- CNG has a higher auto ignition temperature (1,200 ^{o}F) than diesel fuel (500 ^{o}F) or gasoline (500 ^{o}F);
- CNG is more difficult to ignite since it has a "lower flammability limit" that is higher (5.3 percent) than gasoline (one percent) or diesel fuel (0.5 percent); and,
- Natural gas can be directly shipped via pipelines to the compressor station, rather than by on-road delivery trucks, and has less delivery accident risk than vehicle shipments.

The compressed natural gas cylinders in vehicles are built to the Standards for CNG Vehicular Fuel Systems, specified in NFPA 52. CNG fuel tanks are made of one-half to three-quarter inch aluminum or steel and have been shown to be safer than conventional gasoline tanks in accidents. If a sudden release of CNG were to occur, the gas disperses rather than pooling or forming a vapor cloud like gasoline. Due to the high ignition temperature of CNG, the risk of fire is lower than gasoline and comparable to diesel fuel (SCAQMD, 2003).

CNG bottles are typically stored above ground as opposed to below ground for gasoline or diesel fuel tanks. As such, there is a risk of vehicles colliding with the bottles causing a gas release. This can generally be mitigated by installation of curbing and bollards to protect the tanks from vehicle operations.

The main additional hazard associated with the use of CNG versus conventional fuels is the exposure to high pressures employed during storage, dispensing and operations. Due to these high pressures a large amount of gas could escape in a short amount of time and,

if present under flammable conditions, could explode in the presence of an ignition source. Another potentially significant hazard is a release of natural gas during vehicle maintenance.

There are various existing regulations and recommended safety procedures that, when employed, will reduce any slightly higher insignificant hazards associated with use of alternative clean fuels to the same or lower level as conventional fuels. For example, the regulations and safety procedures associated with danger of releasing gas potentially creating explosive hazards includes the procedure to install methane detection systems to provide early detection of leaks and alert the maintenance personnel (CFC 2903.2.5). In addition, ignition sources can be reduced/eliminated by ensuring that all electrical systems are explosion proof (smoking and open flames are prohibited under CFC 2901.7). Providing adequate ventilation can prevent the occurrence of explosive conditions (required under CFC2903.1). Procedures can be established to ensure that all vehicles requiring maintenance are defueled and depressurized before admission to the maintenance depot (SCAQMD, 2003).

Electric Powered Vehicles

Electricity used to power vehicles is commonly provided by batteries, but fuel cells are also an emerging competitor. Batteries are energy storage devices and fuel cells convert chemical energy to electricity. Commercially available electric vehicles are mostly battery-powered at the present time. The following discussion concentrates, therefore, on battery powered electric vehicles.

In 1996, the International Center for Technology Assessment (ICTA) conducted a comprehensive review of the safety concerns associated with the use of electric vehicles. ICTA evaluated what it considered to be the four most pressing safety considerations associated with the use of electric vehicles, which include hydrogen offgassing, electrolyte spillage, electric shock, and exposure to toxic fumes. First, the ICTA found that hydrogen offgassing risks are not present in the three types of batteries likely to be used in electric vehicles. In fact, in these three battery technologies hydrogen gas is not released as part of the chemical processes, which take place during normal operation. Additionally, the risk of hydrogen emissions during stressful conditions has been minimized by the use of seals and proper valve regulation. Finally, the National Electric Code's (NEC's) and the Society of Automotive Engineer's (SAE's) recommended safety practices and guidelines for the operation and maintenance of electric vehicles, minimizes the hydrogen gas risk during battery recharging (ICTA, 1996).

Second, the ICTA found that electric vehicle batteries do not present a serious risk of burns from electrolyte spillage. While electrolyte leakage presents a risk in today's internal combustion engine vehicles because of their use of flooded lead acid batteries, most electric vehicles use batteries that are sealed, maintenance-free, and use either starved or gelled electrolyte. Moreover, the SAE, in conjunction with existing federal safety standards, has established standards that regulate the amount of electrolyte allowed to escape during an electric vehicle accident. As a result of these battery technologies

and the SAE efforts, the amount of electrolyte that can escape from a breached battery casing resulting from an accident has been minimized (ICTA, 1996).

Third, the ICTA found that the risk of electric shock from electric vehicle use and charging poses minimal safety risk. The entire design of electric vehicles has been premised around minimizing electrical hazards. The high voltage circuits in current electric vehicle designs are self-contained and entirely isolated from the passenger compartment, other electric conductors on board the vehicle, and from the vehicle chassis itself (unlike the battery in a conventional internal combustion engine vehicle, which uses the frame as grounding). Electric vehicles further isolate sources of electricity by using automatic disconnection devices in the event of a malfunction to disconnect the main propulsion battery from all electrical components in the vehicle. Finally, the SAE and manufacturers have worked closely to ensure that the NEC provides for the safe use of both conductive and inductive electric vehicle charging systems (ICTA, 1996).

Fourth, ICTA found that the configuration of modern electric vehicles minimizes the risk of exposure to toxic and hazardous materials during normal operating conditions. By isolating batteries and battery packs from the rest of a vehicle operating system, the chance of fire that could cause batteries to release toxic fumes is minimized. Moreover, crash tests and direct combustion attempts have indicated that batteries themselves are virtually non-flammable. In addition, U.S. OSHA has set strict standards to ensure that battery manufacturers do not expose workers to harmful doses of toxic or carcinogenic materials during manufacture (ICTA, 1996).

Overall, ICTA's findings support the view that the widespread adoption of electric vehicles will result in safer vehicles than the gasoline- or diesel-fueled ICEs currently in use (ICTA, 1996). Given ICTA's findings on electric vehicle safety, significant hazards risks are not expected from using this technology.

Conclusion: Conventional fuels, such as gasoline and diesel fuel, have been used since the introduction of the internal combustion engine, and their associated hazards are well known. The alternative clean-fuels discussed in this section pose different hazards during storage, handling, transport, and use than conventional fuels. In general, the hazards posed by the conversion to alternative clean fuels appear no greater than those posed by conventional fuels, particularly when compared to gasoline. Compared to gasoline, hazards due to fuel leakage are lower due to the lower vapor densities, higher auto ignition temperatures, and the higher "Lower Flammability Limits" of the clean fuels.

There are various existing regulations and recommended safety procedures that, when employed, will reduce any slightly higher insignificant hazards associated with use of alternative clean fuels to the same or lower level as conventional fuels. Therefore, when affected operators comply with existing regulations and recommended safety procedures, hazards impacts associated with the use of alternative clean-fuels will be the same or less than those of conventional fuels. Accordingly, significant hazard impacts are not expected from the use of alternative fuels.

Use of alternative fuels will require additional knowledge and training of emergency responders and of owners/operators of fueling stations regarding maintaining and operating alternative fuel refueling stations. Therefore, when users of alternative fuels (including responders and owners/operators of fueling stations) comply with existing regulations and recommended safety procedures, hazards impacts associated with the use of alternative clean-fuels will be the same or less than those of conventional fuels. Accordingly, significant hazard impacts are not expected from the increased use of alternative fuels.

Other Hazard Impacts

The following discussion of "Other Hazard Impacts" discusses additional topics on the CEQA Environmental Checklist, and some of these topics are not applicable to the 2005 Ozone Strategy. These topics include hazardous materials, airport land use plans, adopted emergency response plans and wildland fire hazards.

Government Code §65962.5 typically refers to a list of facilities that may be subject to Resource Conservation and Recovery Act (RCRA) permits. Most facilities affected by the proposed control measures are not expected to be on this list and would not typically be expected to generate large quantities of hazardous materials. For any facilities affected by the proposed control measures that are on the list, it is anticipated that they would continue to manage any and all hazardous materials in accordance with federal, state and local regulations.

The proposed project will not adversely affect any airport land use plan or result in any safety hazard for people residing or working in the Air District. U.S. Department of Transportation – Federal Aviation Administration Advisory Circular AC 70/7460-2K provides information regarding the types of projects that may affect navigable airspace. Projects that involve construction or alteration of structures greater than 200 feet above ground level within a specified distance from the nearest runway; objects within 20,000 feet of an airport or seaplane base with at least one runway more than 3,200 feet in length and the object would exceed a slope of 100:1 horizontally (100 feet horizontally for each one foot vertically from the nearest point of the runway; etc.), may adversely affect navigable airspace. Control measures in the proposed 2005 Ozone Strategy are not expected to require construction of tall structures near airports so potential impacts to airport land use plans or safety hazards to people residing or working in the vicinity of local airports are not anticipated. This potential impact is not considered to be significant.

The proposed project will not impair implementation of, or physically interfere with any adopted emergency response plan or emergency evacuation plan. Any existing commercial or industrial facilities affected by proposed control measures will typically have their own emergency response plans for their facilities already in place. Emergency response plans are typically prepared in coordination with the local city or county emergency plans to ensure the safety of not only the public, but the facility employees as well. Adopting the proposed 2005 Ozone Strategy is not expected to interfere with any

emergency response procedures or evacuation plans and, therefore, is not considered to be significant.

The proposed 2005 Ozone Strategy would typically affect existing urbanized, commercial or industrial facilities in appropriately zoned areas. Since urbanized, commercial and industrial areas are not typically located near wildland or forested areas, implementing control measures is not expected to increase the risk of wildland fires. This impact is considered less than significant.

Conclusion: Based on the above evaluation and significance criteria, other hazard impacts associated with implementation of the 2005 Ozone Strategy are expected to be less than significant.

3.8.4 MITIGATION MEASURES

PROJECT SPECIFIC MITIGATION: The impacts associated with the use of anhydrous ammonia are potentially significant. No feasible mitigation measures have been identified to reduce this impact to less than significant.

3.8.5 CUMULATIVE HAZARD IMPACTS

The 2005 Ozone Strategy contains several control measures that could generate hazard/human health impacts through increased usage of coating products reformulated with acetone or other hazardous formulations. It is expected that the increased use of certain hazardous exemption compounds (e.g., acetone) would generally be balanced by a decreased use of other hazardous and flammable materials (e.g., methyl ethyl ketone, toluene, and xylenes). Therefore, no significant cumulative impacts are identified.

The potential adverse hazard impacts associated with the 2005 Ozone Strategy include additional use of ammonia in SCRs. These project-specific impacts would be expected to be minimized by the impact specific mitigation measures identified above.

CUMULATIVE HAZARD IMPACT MITIGATION: No significant adverse cumulative hazard impacts were identified so no mitigation measures are required.

3.9 HYDROLOGY AND WATER QUALITY

3.9.1 ENVIRONMENTAL SETTING

Bays and Estuaries

The San Francisco Bay and the San Joaquin-Sacramento River Delta combine to form the West Coast's largest estuary, where fresh water from rivers and numerous smaller tributaries flows out through the Bay into the Pacific Ocean. The San Francisco Bay Estuary (Estuary) encompasses roughly 1,600 square miles, drains more than 40 percent of the state, provides drinking water to approximately two-thirds of California, and irrigates 4.5 million acres of farmland. The Estuary also enables residents of the Bay Area to pursue diverse activities including shipping, fishing, recreation, and commerce (SFEP, 2004). The Estuary is composed of three distinct hydrographic regimes: The South Bay extends from the Bay Bridge to the southern terminus of the Bay in San Jose, and the Central and North Bays connect the Delta and the Pacific Ocean.

The North Bay consists of several small bays, the two largest being San Pablo Bay and Suisun Bay. The bays are connected to each other and the ocean by deep, narrow channels ranging from 42 feet deep in San Pablo Bay to over 360 feet deep at the Golden Gate. San Pablo Bay is characterized by a deep channel surrounded by broad shoals. San Pablo Bay is connected to Suisun Bay by the narrow Carquinez Strait. Suisun Bay is a shallow basin consisting of braided channels and shallow shoals.

The Central Bay has a highly complex bathymetry. East of the Golden Gate, the depth is approximately 300 feet, where extensive intertidal mudflats are present at the eastern edge of the Central Bay. In addition, several islands are located within the Central Bay, including Treasure, Alcatraz, and Angel islands.

The South Bay is characterized by large areas of broad shallows incised by a main channel 30 to 65 feet deep. It has similar bathymetry to San Pablo and Suisun Bays. A relatively deep channel extends along the western side of the South Bay, surrounded by broad mudflats.

Beneficial uses of the Bay include agricultural supply, fish spawning, and wildlife habitat, commercial and sport fishing, estuarine habitat, fresh water replenishment, ground water recharge, industrial water supply, fish migration, municipal and domestic water supply, navigation, industrial process water supply, preservation of rare and endangered species, contact and non-contact water recreation, and shellfish harvesting, (RWQCB, 1995).

Water Quality

The region discharges an estimated 5,000 to 40,000 metric tons of at least 65 pollutants into the Estuary each year. These pollutants come from industry, commerce,

transportation, agriculture, household maintenance and other activities. The 200 sewage plants and industries that discharge wastewater directly into the Estuary via a specific pipe or drain are known as point sources of pollution. Pollutants also reach the Estuary from "nonpoint" sources that include urban and agricultural runoff, spills, atmospheric fallout, dredging, landfill seepage, natural erosion, and decay processes (SFEP, 2004).

The overall goals of water quality regulation according to the Water Quality Control Plan for the San Francisco Bay Basin (Basin Plan) are to protect and maintain thriving aquatic ecosystems and the resources those systems provide to society, and to accomplish these goals in an economically and socially sound manner (RWQCB, 1995).

The San Francisco Estuary Institute had administered a Regional Monitoring Program for the Regional Water Quality Control Board (RWQCB) and major wastewater dischargers into the Bay since 1993. Most dischargers to the Bay are required to participate as a condition of their discharge permit. SFEI conducts monitoring three times a year along the central line of the Bay from the Delta to the South Bay. The Regional Monitoring Program measures concentrations of trace constituents in water, sediment, and transplanted bivalves at various locations in the Estuary.

The Regional Monitoring Program monitors conventional water quality (such as salinity, dissolved oxygen, and temperature) and chemistry (such as metals and pesticides), water toxicity (effects on laboratory organisms), sediment characteristics and chemistry, sediment toxicity (effects on laboratory organisms), and contaminant bioaccumulation in shellfish.

Based on water quality analyses, the level of contamination in the Estuary is high enough to impair the health of the ecosystem. The Estuary is described as moderately impaired. Indications of impairment include the toxicity of the water and sediment samples; the frequent presence of contaminant concentrations exceeding water, sediment and fish guidelines; and altered communities of sediment dwelling organisms. Overall, sites in the lower South Bay, the Petaluma River mouth, and San Pablo Bay are more contaminated than other sites. Contamination in the Central Bay is lower primarily due to mixing with relatively clean ocean water. Of all the contaminants measured by the Bay's RMP, results suggest that those of greatest concern are mercury, polychlorinated biphenyls (PCBs), and diazinon, and chlorpyrifos (two pesticides). Also of concern are copper, nickel, zinc, DDT, chlordane, dieldrin, dioxins, polyaromatic hydrocarbons (PAHs) and selenium (SFEI, 2004).

Drainage and Runoff

Stormwater pollution occurs when rain comes into contact with materials and picks up and washes contaminants into storm drains, creeks or the Bay. Common sources of pollution include equipment and vehicles that may leak oil, grease, hydraulic fluid or fuel, construction materials and products, waste materials, landscaping runoff containing fertilizers, pesticides or weed killers, and erosion of disturbed soil. Stormwater discharges associated with industrial and construction activities are regulated according

to California Code of Regulations Section 402(p) under the National Pollutant Discharge Elimination System (NPDES) permitting system.

Typical pollution control measures include Best Management Practices (BMPs) that are designed to reduce quantities of materials used that may produce pollutants, change the way various products are handled or stored, employ various structural devices to catch and restrict the release of pollutants from the site, and set out appropriate responses to spills and leaks. Examples of BMPs include: temporary silt fences; protection devices such as rock aprons at pipe outlets; stabilized pads or aggregate at points where construction site leads to or from a public street; temporary drain inlet protection devices such as filter fabric and sand bags; concrete washouts for cement mixers; preservation of existing vegetation; vehicle and equipment cleaning, etc. Site-specific BMPs are described in a stormwater pollution prevention plan (SWPPP).

SWPPPs are designed to identify and evaluate sources of pollutants associated with industrial and construction activities that may effect the quality of stormwater discharges and authorized non-stormwater discharges from a facility; and to identify and implement site-specific BMPs to reduce or prevent pollutants associated with industrial or construction activities in stormwater discharges or authorized non-stormwater discharges.

Floodplain Risk

Some areas of the Bay along the shoreline and drainages leading to the Bay are potential floodplains. Risk associated with building in a floodplain include threats to life and property. The level of risk is determined by the nature of the facility, its location and appropriate mitigation measures. Local city or county government agencies regulate floodplain construction, management, and mitigation through land use controls, based on determinations of flood elevations.

Groundwater

Groundwater is subsurface water that occurs beneath the water table in soils and geologic formations that are fully saturated. Where groundwater occurs in a saturated geologic unit that contains sufficient permeable thickness to yield significant quantities of water to wells and springs, it is called an aquifer. A groundwater basin is a hydrogeologic unit containing one large aquifer or several connected and interrelated aquifers. There are three basins beneath the greater San Francisco Bay Area: The San Francisco, Santa Clara, and San Pablo Basins. The San Francisco Basin extends north from the Dumbarton Bridge to the shoreline south of Richmond and the San Pablo Basin extends north of the San Francisco Basin. The Santa Clara Basin is located south of the San Francisco Basin. The San Francisco and Santa Clara Basins have a similar stratigraphic and tectonic development, while the San Pablo Basin appears to have had a different history. Bedrock appears to be the primary boundary between the San Francisco and San Pablo Basin. The Hayward Fault appears to form a groundwater barrier along portions of the basins (Norfleet Consultants, 1998).

Salt water intrusion occurred in upper aquifers between Alameda and Niles Cone in the Santa Clara Basin between the mid 1920's and late 1940's. A combination of drought and overpumping caused groundwater levels to fall below sea level in about 1924. When this occurred, there was widespread salt water intrusion through the young bay mud into the upper aquifer and eventually into the deeper aquifers. Evaluation for the intrusion revealed that there were no natural direct pathways to the deeper aquifers. Intrusion occurred via abandoned wells and reverse hydrostatic head from high pumping rates (Norfleet Consultants, 1998).

The Department of Water Resources (DWR) has identified 31 individual ground water basins in the San Francisco Bay Region that were or could serve as sources of high quality drinking water. Maintaining the high quality of groundwater is the primary objective of the RWQCB, which defines the lowest concentration limit required for groundwater protection. The RWQCB also has water quality limits for bacterial, chemical constitutes, radioactivity, taste and odor. Maximum Contaminant Levels (MCLs) and Secondary Maximum Contaminant Levels (SMCLs), have also been implemented to protect the beneficial uses of municipal and domestic drinking water sources (RWQCB, 1995).

3.9.2 SIGNIFICANCE CRITERIA

Potential impacts on water resources will be considered significant if any of the following criteria apply:

The project will cause degradation or depletion of ground water resources substantially affecting current or future uses.

The project will cause the degradation of surface water substantially affecting current or future uses.

The project will result in a violation of National Pollutant Discharge Elimination System (NPDES) permit requirements.

The project results in substantial increases in the area of impervious surfaces, such that interference with groundwater recharge efforts occurs.

The project results in alterations to the course or flow of floodwaters or places structures within a 100-year flood zone.

3.9.3 Environmental Impacts

Table 3.9-1 lists the control measures associated with the 2005 Ozone Strategy with potential hydrology/water quality impacts.

Water Quality Impacts

PROJECT-SPECIFIC IMPACTS: Several of the control measures in the Ozone Strategy would include controlling VOC emissions through the reformulation of coatings and solvents including SS 1 – Auto Refinishing, SS 2 – Graphic Arts Operations, SS 3 – High Emitting Spray Booths, and SS 4 – Polyester Resin Operations, and SS 5 – Wood Products Coating. Emission reductions are expected to be achieved through the use of near-zero and zero VOC formulations, or through the use of air pollution control equipment. These control measures would enhance existing BAAQMD rules by increasing the number of facilities controlled, removing or reducing the exemptions, and/or requiring control devices.

Under these control measures, petroleum-based solvents, coatings and products are expected to be reformulated to aqueous-based solvents, coatings and products to comply with specified VOC emission reduction requirements. Like petroleum-based materials, aqueous materials may lead to adverse impacts to water resources if contaminated solvents, coatings or products are not handled properly. However, the use of water to reformulate coatings, solvents and products would generally lead to products that would be less toxic than petroleum based materials and generate fewer impacts to water quality.

TABLE 3.9-1

Control Measures with Potential Hydrology and Water Impacts

Control Measures	Control Measure Description	Control Methodology	Impact
SS 1	Auto Refinishing	Reformulated low-VOC coatings/solvents	Potential increased use of water based formulations
SS 2	Graphic Arts Operations	Reformulated low-VOC coatings/solvents	Potential increased use of water based formulations
SS 3	High Emitting Spray Booths	Reformulated low-VOC coatings/solvents, add on control devices	Potential increase in use of water based formulations
SS 4	Polyester Resin Operations	Reformulated low-VOC coatings/solvents	Potential increased use of water based formulations
SS 5	Wood Products Coating	Reformulated low-VOC coatings/solvents	Potential increased use of water based formulations
SS 11	Wastewater Systems	Installation of vapor recovery devices, seals/traps on drains, installation of solid piping, installation of water seals	Increase in VOCs in wastewater could enter oil-water separator and system may not handle increased load
TCM 7	Improve Ferry Service	Construction of new facilities, use of low emission ferries, and add-on controls	Increase potential for fuel spills and water quality degradation in San Francisco Bay

The use of aqueous based solvents, coatings and products may lead to adverse impacts to water resources if contaminated solvents are not handled properly. If the aqueous cleaning operation does not substantially increase the amount of hazardous wastewater

generated, then disposing of the wastewater will generally be considered a relatively small incremental addition to the wastewater stream and no adverse impacts would be expected. If, however, the material becomes contaminated with hazardous materials during the manufacturing or cleaning process, then the solution must be disposed of properly after its useful life. Proper disposal may be accomplished by use of wastewater treatment equipment or by shipping to a waste treatment, recycling or disposal site that accepts hazardous materials.

In the event that untreated solvent baths are discharged to the sewer system, adverse impacts could occur at the treatment plants. Potential impacts could include pass-through of untreated material or toxicity to biological treatment systems. The magnitude of the impact would depend on the quantity of the discharge and the species discharged, but in most instances, the adverse impact would derive from the contaminants mixed with the solvent and not the solvent itself. While it is unlikely that a single user of aqueous solvents would pose adverse significant water quality impacts, District-wide application of aqueous solvents with general discharge of emulsifying agents and contaminants may exceed the concentration limits of the receiving wastewater treatment plants. Further, it is possible that existing operations that currently hire a "turn-key" service (i.e., a service which delivers clean solvent and removes spent material for off-site redistillation and reuse) may discontinue such service and discharge used aqueous cleaners as wastewater, thereby resulting in an incremental increase in wastewater discharged as compared to petroleum-based solvents.

In connection with potential water quality impacts associated with SCAQMD rules or rule amendments similar to the control measures proposed by the BAAQMD, the Los Angeles County Sanitation District (LACSD) performed a study in response to the 1996 amendments to SCAQMD Rules 1171 - Solvent Cleaning Operations (which involves similar requirements as control measure SS 1 – Auto Refinishing), and the 1997 amendments to SCAQMD Rule 1122 - Solvent Degreasers. The CEQA analysis for these rule amendments concluded that they would result in a widespread conversion to the use of aqueous materials for cleaning operations. Four categories of pollutants – metals, conventional pollutants, toxic volatile organics, and surfactants – were monitored in four sampling episodes from August 1998 to June 1999 and compared with baseline concentrations dating back to at least 1995 (SCAQMD, 2003).

Six metals – cadmium, chromium, copper, lead, nickel, and zinc – were also studied. These six metals' average concentrations in the wastewater stream showed no appreciable change from the baseline concentrations. Three conventional pollutants – total dissolved solids (TDS), chemical oxygen demand (COD), and total suspended solids (TSS) – were studied. Conventional pollutant concentrations also showed no appreciable change from the baseline concentrations. A number of toxic VOCs were studied including perchloroethylene and toluene. Perchloroethylene and toluene were monitored because they are commonly found in automotive repair cleaners and could contaminate the aqueous-based cleaners that are discharged to the sewer. The study found that perchloroethylene concentrations are increasing. The increase in the influent to the treatment plant is believed to be from consumer products used by home auto maintenance

as well as a potential contribution from aqueous-based cleaners used by automotive repair facilities. Surfactants are used in personal care and cleaning products, and are measured in wastewater as methylene blue active substances (MBAS). MBAS concentrations are increasing from the baseline concentrations (SCAQMD, 2003).

Although concentrations increased for perchloroethylene and MBAS, it is not believed that aqueous-based cleaners are the major source. Subsequent to the conversion to, and use of aqueous-based cleaners, the LACSD has not experienced water quality issues related to aqueous-based cleaners and has not seen increasing trends in any measured pollutants due to the use of aqueous-based cleaners (SCAQMD, 2003).

There is the potential for the increased use of methylene chloride and perchloroethylene in reformulation of consumer products, which are specifically exempt from the definition of VOCs by CARB in recognition of their very low ozone forming capabilities. However, the BAAQMD does not exempt these compounds. Some manufacturers could use methylene chloride or perchloroethylene in their formulations to reduce the VOC content to meet future limits. CARB and the BAAQMD have taken steps to mitigate and limit the use of these compounds in recent Board actions. These actions include the Air Toxic Control Measure for automotive maintenance and repair activities, aerosol adhesives limits in the consumer products regulation; and reactivity limits in the aerosol coating regulations. CARB also tracks the use of methylene chloride and perchloroethylene in regulated consumer products through yearly manufacturer reporting requirements. Further, CARB staff has proposed VOC limits in the past that were achievable without the increased use of TACs (CARB, 2002). Also, Proposition 65 labeling requirements discourage manufacturers from reformulating consumer products with listed materials (which include methylene chloride and perchloroethylene).

As with solvent based materials, the illegal disposal of spent cleaning materials could result in significant adverse water quality impacts. Potential adverse wastewater impacts associated with reformulated solvents are expected to be minimal since: (1) compliance with State and federal waste disposal regulations would preclude adverse impacts; (2) "turn-key" services are available for aqueous cleaners; (3) some solvent cleaning operators may currently be disposing of spent material illegally; and (4) the amount of wastewater which may be generated from reformulated solvents is well within the projected receiving capacity of the publicly owned treatment works (POTWs) or wastewater treatment plants in the Bay Area.

Impacts to water quality from reformulated coatings (i.e., water-based coatings) would be due to the increased use of water for clean-up and the resultant increased discharge into the sewer system. Analysis estimated that the use of reformulated coatings to comply would be expected to generate about 3,760,745 gallons per year of wastewater by 2010 or about 10,304 gallons per day (see Table 3.9-2).

TABLE 3.9-2
Estimated Increased Wastewater in the Bay Areas
Associated with Reformulated Coatings[(1)]

COUNTY	1999 Average Daily Wastewater Flow (gal)	2010 Coatings Disposal (gal)	2010 Coatings Disposal (gal/day)	Total Impacts (% Increase in Wastewater Flow)
Alameda	155,399,800	805,395	2,207	0.0014
Contra Costa	66,268,000	499,382	1,368	0.0021
Marin	18,981,200	125,870	345	0.0018
Napa	1,697,000	69,876	191	0.0113
San Francisco	86,700,000	380,902	1,044	0.0012
San Mateo	56,000,000	396,997	1,088	0.0019
Santa Clara	170,060,000	984,016	2,696	0.0016
Solano	34,938,100	233,241	639	0.0018
Sonoma	25,408,400	265,066	726	0.0029
Total	615,452,500	3,760,745	10,304	0.0029

(1) Source: CARB, 2000

POTWs in the region are expected to be able to accommodate the potential increase in wastewater associated with reformulated coating. (The POTWs have an overall capacity of about 615.5 million gallons per day.) Further, State and federal regulations are expected to promote the development and use of coatings formulated with non-hazardous solvents. Wastewater which may be generated from reformulated coatings is expected to contain less hazardous materials than the wastewater generated for solvent-based coating operations, thereby reducing toxic influent to the POTWs.

The potential effects of reformulating coatings to water-based formulation differ from that for solvent cleaning operations. The significance determination for reformulated solvents is due to the concern that current cradle-to-grave operations may largely be replaced by practices that generate wastewater. The wastewater generated from solvent cleaning operations could contain contaminants at levels exceeding regulatory limits. The POTWs and other responsible agencies may not have sufficient resources to adequately inspect and monitor the effluent from the large number of solvent cleaning operations in the region.

Unlike the reformulation of solvent cleaning materials, coating operations currently generate wastewater. As discussed above, the reformulation of coatings could have a beneficial effect by reducing the levels of contaminants currently found in the wastewater from these operations. The amount of increased wastewater generated from coating operations would be well within the capacity of the regions POTWs. Consequently, wastewater impacts from coating reformulation are not considered significant.

SS 11 – Wastewater Systems would reduce ROG emissions from refinery wastewater systems by requiring control, covers or water traps at various emission points such as

open drains, sumps, junction boxes and manholes. The affected wastewater systems are part of existing refinery operations which include oil-water separators, biological and/or chemical treatment, and settling and clarification processes that occur to meet water discharge standards. Because of the nature of these processes and the ability of system operators to affect upstream hydrocarbon loading, any incremental increase in hydrocarbons that could go into the treatment system process as a result of this control strategy would not be expected to cause an exceedance of the refineries water discharge permits. Therefore, water quality impacts resulting from wastewater controls are not expected to be significant.

TCM 7 – Improve Ferry Service could result in an increased potential for fuel spills and water quality degradation in San Francisco Bay, e.g., during refueling operations or from spills or leaks. Although there is the potential for a spill, it was determined to be less than significant following mitigation which included a strengthened Harbor Safety Plan; reviewed and modified contingency plans, drill exercises and emergency response service agreements; educational programs for operators; and improvement technological designs on new fleets to avoid fuel spills (WTA, 2003).

Conclusion: Based on the above evaluation and significance criteria, the impacts on water quality associated with implementation of the 2005 Ozone Strategy are expected to be less than significant, with the exception of the water quality impacts associated with TCM 7.

PROJECT-SPECIFIC MITIGATION: The following mitigation measures were required by the WTA for TCM 7 – Improve Ferry Service:

HWQ1 Adoption of BMPs during construction to prevent, minimize, and clean up spills and leaks from construction equipment would reduce the potential for impacts to water quality. Examples of BMPs include refueling and maintenance of equipment only in designated lined and/or bermed areas, isolating hazardous materials from stormwater exposure, and preparing and implementing spill contingency plans in specified areas. Any equipment with a fuel tank or other oil tank, such as heavy excavation machinery, must be considered as a potential source of released oil. Storage and parking of such equipment shall take into account oil spill prevention regulations to ensure that the area is free of drains or other avenues through which spills may escape containment.

HWQ2 New terminal facilities shall be designed such that stormwater runoff would be controlled and discharged in an appropriate manner. Construction and industrial stormwater NPDES permits would be required, and BMPs shall be adopted to reduce the chance of pollutants entering surface and ground water, thereby reducing the potential for impacts to water quality. Typical pollution control measure include BMPs designed to reduce the quantities of materials used that may produce pollutants, changing the way various products and materials are handled or stored, employing various structural devices to catch and restrict the release of pollutants, and establishing appropriate responses to spills and leaks.

Examples of BMPs include: temporary fencing; protection devices such as rock aprons at pipe outlets; stabilized pads of aggregate at points where construction traffic would be leaving an unimproved construction site to enter a public street; temporary drain inlet protection devices such as filter fabric and sand bags; concrete washouts for cement mixers; preservation of existing vegetation; and vehicle and equipment cleaning.

Impacts on water quality are considered to be less than significant following mitigation measures.

Stormwater Impacts

PROJECT-SPECIFIC IMPACTS: TCM 4 - Upgrade and Expand Local Regional Rail Service, TCM5 - Improve Access to Rails and Ferries, and TCM 7 - Improve Ferry Service would require the construction of new terminals and transportation facilities. Construction and operation of terminal facilities, including parking lots, access roads, railroads, and buildings would increase the amount of impervious surface at terminal sites, causing an increase in stormwater discharge. If the stormwater came in contact with pollutants or disturbed soil, discharge of runoff could impact the quality of the receiving water. Sources of pollution during project construction could include oil leaked from heavy equipment and vehicles, grease, hydraulic fluid, fuel, construction materials and products, waste materials, landscaping runoff containing fertilizers, pesticides or weed killers, and erosion of disturbed soil.

Stormwater discharges associated with construction activities are regulated according to CCR§402(p) under the NPDES. Under the NPDES construction permit, owners of the proposed terminal locations where construction would disturb more than one acre of land would have to submit a Notice of Intent (NOI), develop a SWPPP, conduct monitoring and inspections, retain monitoring records, report incidences of noncompliance, and submit annual compliance by July 1 of each year.

The majority of terminals are expected to be located in developed areas, many of which may already have water quality problems (WTA, 2003).

Conclusion: Based on the above evaluation and significance criteria, the impacts of the 2005 Ozone Strategy on storm water discharge are potentially significant.

PROJECT-SPECIFIC MITIGATION MEASURES: See "Water Quality Impacts" above for the mitigation measures imposed for water impacts. The mitigation measures HWQ-1 and HWQ-2 are expected to reduce the potential impacts associated with TCM 7 on water quality to less than significant. Impacts associated with TCMs 4 & 5 are expected to be mitigated to a less than significant level through compliance with existing stormwater discharge requirements.

Potential Impacts Associated with Flood Zones

PROJECT-SPECIFIC IMPACTS: Facilities potentially affected by the proposed stationary source control measures are expected to be industrial and commercial facilities. Land use planning guidelines would generally prohibit the siting of industrial and commercial facilities within 100-year flood zones. Therefore, no significant impacts related to flood zones associated with stationary source control measures are expected.

TCM 7 - Improve Ferry Service would require the construction of new ferry terminals. None of the potential ferry terminal sites lie within the 100-year floodplain as mapped by the Federal Emergency Management Agency (FEMA) so the potential for impacts from flooding is considered less than significant (WTA, 2003).

TCM 4 – Upgrade and Expand Local and Regional Rail Service, and TCM5 – Improve Access to Rails and Ferries would require the construction of new terminals and transportation facilities. It is also expected that new rail service and terminals can be sited outside flood zones.

Conclusion: None of the proposed control measures would require or result in placing housing in a 100-year flood zone, or expose people or structures to a significant risk or loss due to flooding so that the potential for impacts from flooding would be less than significant.

PROJECT-SPECIFIC MITIGATION: No significant impacts due to flood zones are expected, therefore, mitigation measures are not required.

Potential Impacts Associated with Ground Water Depletion

PROJECT-SPECIFIC IMPACT: Increased water consumption may occur due to the reformulation of coatings to aqueous-based materials. Several of the control measures in the 2005 Ozone Strategy would propose to control VOC emissions through the reformulation of coatings and products including SS 1 – Auto Refinishing; SS 2 – Graphic Arts Operation; SS 3 – High Emitting Spray Booths; SS 4 – Polyester Resin Operations; and SS 5 – Wood Products Coating. No other control measures were identified that were expected to result in an increase in water use.

CARB estimated the amount of water use associated with its proposed architectural coatings suggested control measure (CARB, 2000). The primary objective of CARB's control measure was to set VOC limits and other requirements that are feasible (based on current technology) and that will achieve significant emission reductions in VOC emissions from architectural coatings. CARB estimated that the projected water demand in the Bay Area would be about 6.28 million gallons per year by 2010 or about 17,206 gallons per day (CARB, 2000). Using CARB's estimate for water demand is expected to be conservative because many of the sources that would use reformulated coatings/solvents have already reformulated some of the coatings/solvents, and the estimate assumes that the only method for compliance would be reformulation. This

potential water demand is within the capacity of water supplied from various sources in the Bay Area (estimated water demand of about 1,880 billion gallons per year in 2010) (CARB, 2000) and is not considered significant compared with current and projected future demand and supply. While there are projected drought-year shortages in some regions of California, these shortages would occur regardless of the proposed control measures.

Conclusion: Since the potential impacts on water demand are considered less than significant, the potential for ground water depletion is also considered less than significant. Therefore, no significant water demand impacts or impacts on ground water depletion are expected.

PROJECT-SPECIFIC MITIGATION: No significant impacts due to groundwater depletion are expected, therefore, mitigation measures are not required.

3.9.4 MITIGATION MEASURES

The mitigation measures for each impact area were included within each subchapter. The mitigation measures identified for hydrology and water quality impacts are expected to reduce identified impacts to less than significant following mitigation.

3.9.5 CUMULATIVE HYDROLOGY AND WATER QUALITY IMPACTS

Wastewater generated as a result of implementing the 2005 Ozone Strategy control measures related to reformulated coatings, and solvents could have an incremental impact on sewer systems, but this affect is not expected to cause significant adverse cumulative impacts. In addition, the impact specific mitigation measures are expected to further minimize the potential for significant impacts.

Implementation of the 2005 Ozone Strategy will have only minor incremental impacts on water quality compared to impacts due to population growth and is not considered significant. There may be significant cumulative impacts on hydrology and water quality due to increases in population associated with increased population (e.g., increased water demand, increased wastewater discharged, etc.). However, these cumulative impacts are not related to the 2005 Ozone Strategy. No other cumulative impacts have been identified.

CUMULATIVE HYDROLOGY AND WATER QUALITY IMPACT MITIGATION: No significant adverse cumulative hydrology and water quality impacts were identified so no mitigation measures are required.

3.10 LAND USE AND PLANNING

3.10.1 ENVIRONMENTAL SETTING

The San Francisco Bay Area has grown from the sparsely populated Native American and Spanish settlements of the past, to an urban area of nearly seven million people today. The pattern of land use in the Bay Area runs from one of the most densely populated urban centers in the United States (the City of San Francisco), to open hills and shorelines, and from growing suburban areas, to still-viable farming areas.

Since the mid 1940's, the San Francisco Bay Area has grown from a primarily agricultural region with one major city (San Francisco), to the fourth most populous metropolitan region in the United States with multiple centers of employment, residential development, and peripheral agricultural areas. The pattern of land uses in the Bay Area includes a mix of open space, agriculture, intensely developed urban centers, a variety of suburban employment and residential areas, and scattered older towns. This pattern reflects the landforms that physically define the region, the Bay, rivers, and valleys. Major urban areas are centered around the Bay, with the older centers close to the Golden Gate. Newer urban areas are found in Santa Clara County to the south, the valleys of eastern Contra Costa and Alameda Counties, and Sonoma and Solano Counties to the north.

The Pacific coast and the northern valleys are primarily in agricultural and open space use, while the agricultural areas adjoining the Central Valley have seen substantial suburban development in recent years, particularly in Solano County and western Contra Costa County.

Land uses vary greatly within the Bay Area and include commercial, industrial, residential, agricultural, and open space uses. The amount of land developed in each of the nine counties varies from a low of 4.5 percent in Napa County to a high of 51 percent in San Francisco. The Bay Area includes 101 cities. Residential uses continue to consume the greatest amount of urban land, approximately 72 percent. With respect to residential densities, after San Francisco, the Berkeley/Albany, Daly City/San Bruno, and Sunnyvale/Mountain View areas have the highest densities, while Healdsburg/Cloverdale, Santa Rosa/Sebastopol, and San Ramon/Danville have the lowest. Most of the Bay Area's population and economy is situated along the perimeter of San Francisco Bay (the Bay), in the older, larger cities such as San Francisco, Oakland, and San Jose. However, the majority of new residential and commercial land use development is occurring in the peripheral cities located in the valleys surrounding the Bay, such as Santa Rosa, Fairfield, and Livermore (MTC, 2004).

The percent of developed land is forecast to increase by 71,482 acres between 2000 and 2030, an increase of 9 percent. This regional development will result in just over 19 percent of all Bay Area land being developed by 2030 (MTC, 2004).

3.10.2 SIGNIFICANCE CRITERIA

Land use and planning impacts will be considered significant if the proposed project conflicts with the land use and zoning designations established by the local jurisdiction (e.g., City or County), creates divisions in any existing communities, or conflicts with any applicable habitat conservation or natural community conservation plan

3.10.3 ENVIRONMENTAL IMPACTS

This subchapter evaluates land use impacts that could occur as a consequence of efforts to improve air quality. Table 3.10-1 lists the control measures with potential land use impacts.

TABLE 3.10-1

Control Measures with Potential Land Use Impacts

Control Measures	Control Measure Description	Control Methodology	Land Use Impact
TCM 7	Improve Ferry Service	Construction of new facilities, use of low emission ferries, and add-on controls	Impacts to shoreline access
TCM 15	Local Land Use Planning and Development Strategies	Influence land use patterns to reduce time and distance traveled	Increase development near transit centers

The proposed 2005 Ozone Strategy will impose control requirements on stationary sources at existing commercial or institutional facilities, and develop transportation and mobile source control measures. As a result, the proposed 2005 Ozone Strategy does not require construction of structures for new land uses in any areas of the Air District and, therefore, is not expected to create divisions in any existing communities or conflict with any applicable habitat conservation or natural community conservation plan.

Population growth, land development, housing, traffic and air quality are interconnected. MTC as the regional transportation planning agency considers these interconnections when developing and implementing plans to improve air quality, transportation systems, land use compatibility and housing opportunities in the region. Any facilities affected by the proposed 2005 Ozone Strategy would still be expected to comply with, and not interfere with, any applicable land use plans, zoning ordinances, habitat conservation or natural community conservation plans.

Land use and other planning considerations are determined by local governments. Nevertheless, some potential control measures encourage local governments to favorably consider mixed-use development, in-fill development, jobs/housing balance, and limits on suburban growth. TCM 15 – Local Land use Planning and Development Strategies seeks to reduce motor vehicle use and emissions by promoting land use patterns and

development projects that facilitate walking, bicycling and transit use. This control measure would focus development near transit stations; encourage development with a mix of uses that locates housing near jobs, shops and services, schools, and other community development; encourages infill development; provides pedestrian and bicycle access; and reduces parking requirements.

While development that conforms to these goals could alter the homogenous character of an existing residential or commercial neighborhood, it is more likely to be incorporated into a new project. In-fill development can remove small and isolated open spaces from a neighborhood, it is more likely to be used to redevelop blighted or underutilized sites. It is anticipated that the local government approving the new development would require the developments to comply with local land use requirements in a manner that would avoid significant adverse effects on existing or new neighborhoods. The potential impacts on local government land use planning would be addressed in general and specific plans where additional environmental review would be conducted. As specific projects are developed, land use impacts need to be evaluated on a case-by-case basis. Thus, no significant adverse land use impact is anticipated from the application of TCM 15 – Local Land Use Planning and Development Strategies, due to the land use approval process in place at cities and counties in the Bay Area.

Adverse impacts to shoreline access and recreational uses from expansion or development of ferry terminal facilities (TCM 7 – Improve Ferry Service) are not expected to be significant, as no direct impacts to parks or trails have been identified (WTA, 2003).

Conclusion: Based on the above evaluation and significance criteria, the impacts of the 2005 Ozone Strategy on land use and planning are expected to be less than significant.

3.10.4 MITIGATION MEASURES

No significant adverse land use and planning impacts have been identified so no mitigation measures are required.

3.10.5 CUMULATIVE LAND USE AND PLANNING IMPACTS

The forecast development of residential and employment land uses in the Bay Area over the next 25 years would result in significant expansion of urban areas and significant changes in land use and the character of neighborhoods in the Bay Area. The 2005 Ozone Strategy and other air plans and control measures have been developed, in part, to develop a strategy for attaining and maintaining compliance with ambient air quality standards in spite of this development. While general population growth may impact land use and planning, the 2005 Ozone Strategy responds to proposed growth by developing control strategies to attain and maintain ambient air quality in spite of substantial population growth.

While the BAAQMD does not exercise land use authority and cannot directly affect the pattern that future land use will take, it can continue to participate and promote efforts to coordinate regional smart growth efforts to use land more efficiently, optimize transportation and preserve open space. Therefore, no significant cumulative impacts on land use and planning related to the 2005 Ozone Strategy are expected.

CUMULATIVE LAND USE IMPACT MITIGATION: No significant adverse cumulative land use impacts were identified so no mitigation measures are required.

3.11 MINERAL RESOURCES

3.11.1 ENVIRONMENTAL SETTING

The BAAQMD covers all of Alameda, Contra Costa, Marin, San Francisco, San Mateo, Santa Clara, and Napa Counties and portions of southwestern Solano and southern Sonoma Counties. The area of coverage is vast so that land uses and the affected environment vary greatly throughout the area. Mineral resources are not specifically defined in the CEQA Guidelines, but generally include petroleum reserves, natural gas reserves, metal ore deposits, specific type of rock deposits (granite or marble), and other similar types of resources. The facilities affected by the proposed control measures are expected to be located in the urban portions within the Bay Area.

3.11.2 SIGNIFICANCE CRITERIA

Project-related impacts on mineral resources will be considered significant if any of the following conditions are met:

> The project would result in the loss of availability of a known mineral resource that would be of value to the region and the residents of the state.
>
> The proposed project results in the loss of availability of a locally-important mineral resource recovery site delineated on a local general plan, specific plan or other land use plan.

3.11.3 ENVIRONMENTAL IMPACTS

There are no provisions of the proposed control measures which would directly result in the loss of availability of a known mineral resource of value to the region and the residents of the state, or of a locally-important mineral resource recovery site delineated on a local general plan, specific plan or other land use plan. The proposed 2005 Ozone Strategy is not expected to deplete non-renewable mineral resources, such as aggregate materials, metal ores, etc., at an accelerated rate or in a wasteful manner because BAAQMD control measures are typically not mineral resource intensive measures. While mineral resources will need to be evaluated as each control measure is

promulgated, significant adverse impacts to mineral resources are not expected due to the 2005 Ozone Strategy.

3.11.4 MITIGATION MEASURES

No significant adverse mineral resource impacts have been identified so no mitigation measures are required.

3.11.5 CUMULATIVE MINERAL RESOURCES IMPACTS

The proposed 2005 Ozone Strategy and other air quality plans, rules and regulations, are not expected to impact mineral resources. Further, these air quality plans, rules and regulations are not expected to deplete mineral resources on a cumulative basis. Therefore, no significant cumulative impacts on mineral resources are expected.

CUMULATIVE MINERAL RESOURCES MITIGATION: No significant adverse cumulative mineral resources impacts were identified so no mitigation measures are required.

3.12 NOISE

3.12.1 ENVIRONMENTAL SETTING

Noise is defined as unwanted sound. The range of sound pressure perceived as sound is extremely large. The decibel is the preferred unit for measuring sound since it accounts for these variations using a relative scale adjusted to the human range for hearing (referred to as the A-weighted decibel or dBA). The A-weighted decibel is a method of sound measurement which assigns weighted values to selected frequency bands in an attempt to reflect how the human ear responds to sound. The range of human hearing is from 0 dBA (the threshold of hearing) to about 140 dBA which is the threshold for pain. Principal Bay Area noise sources are airports, freeways, arterial roadways, port facilities, and railroads. Additional noise generators included industrial manufacturing plants and construction sites. Local collector streets are not considered to be a significant source of noise since traffic volume and speed are generally much lower than for freeways and arterial roadways.

Background noise levels associated with vehicle traffic vary throughout the day based on the average density of noise sources in a given area. Traffic noise at a particular location depends upon the traffic volume on the roadway, the average vehicle speed, distance between the receptor and the roadway, the presence of intervening barriers between source and receiver, and the ratio of trucks (particularly heavy trucks) and buses to automobiles.

A number of factors control how traffic noise levels affect nearby sensitive land uses. These include roadway elevation compared to grade; structures or terrain intervening

between the roadway and the sensitive receptors; and the distance between the roadway and receptors. Caltrans or other sponsors for freeway projects conduct detailed noise studies for the environmental documents when these projects are ready for implementation.

The Bay Area has a large number of freeways and arterial roadways. Typical arterial roadways have one or two lanes of traffic in each direction, with some containing as many as four lanes in each direction. Noise from these sources can be a significant environmental concern where buffers (e.g., sound walls, buildings, landscaping, etc.) are inadequate or where the distance from centerline to sensitive uses is relatively small.

The two basic types of railroad operations are freight trains, and passenger rail operations, the latter consisting of commuter and intercity passenger trains and steel-wheeled urban rail transit. Generally, freight operations occur at all hours of the day and night, while passenger rail operations are concentrated within the daytime and evening periods.

Trains can generate high, relatively brief, intermittent noise events. Train noise is an environmental concern for sensitive uses located along rail lines and in the vicinities of switching yards. Locomotive engines and the interaction of steel wheels and rails generate primary rail noise. The latter source creates three types of noise: (1) rolling noise due to continuous rolling contact; (2) impact noise when a wheel encounters a rail joint, turn out or crossover; and (3) squeal generated by friction of tight curves. For very high-speed rail vehicles, air turbulence can be a significant noise source (MTC, 2004).

Construction can be another significant, although typically short-term source of noise. Construction is most significant when it takes place near sensitive land uses (e.g., schools and hospitals), occurs at night, or in early morning hours. Local governments typically regulate noise associated with construction equipment and activities through enforcement of noise ordinance standards, implementation of general plan policies, and imposition of conditions of approval for building or grading permits.

The principle noise sources in an industrial area are impact, friction, vibration, and air turbulence from air and gas streams. Process equipment, heaters, cooling towers, pumps and compressors, contribute to noise emitted from industrial facilities. Elevated noise sources are not attenuated as quickly as ground sources due to the lack of interference from fences, structures, buildings, etc.

3.12.2 SIGNIFICANCE CRITERIA

Impacts on noise will be considered significant if:

> Construction noise levels exceed the local noise ordinance or, if the noise threshold is currently exceeded, project construction noise sources increase ambient noise levels by more than three decibels (dBA) at the site boundary.

Construction noise levels exceed federal Occupational Safety and Health Administration (OSHA) noise standards for workers.

The proposed project operational noise levels exceed any of the local noise ordinances at the site boundary or, if the noise threshold is currently exceeded, project noise sources increase ambient noise levels by more than three dBA at the site boundary.

3.12.3 ENVIRONMENTAL IMPACTS

Control measures with potential noise impacts are summarized in Table 3.12-1.

TABLE 3.12-1

Control Measures with Potential Noise Impacts

Control Measures	Control Measure Description	Control Methodology	Noise Impact
TCM 4	Upgrade and Expand Local and Regional Rail Service	Construction of additional rail facilities, electrification of rail services	Construction noise and increase in noise from existing and new rail lines
TCM 5	Improve Access to Rails and Ferries	Construction of new facilities, use of low emission vehicles	Construction noise, and increase in noise due to increased traffic
TCM 6	Improve Interregional Rail Service	Construction of new rail facilities	Construction noise and increase in noise from existing and new rail lines
TCM 7	Improve Ferry Service	Construction of new facilities, use of low emission ferries, and add-on controls	Construction noise and increase in noise from expanded ferry operations near ferry terminals
TCM 8	Construct Carpool/Express Bus Lanes on Freeways	Construction of new HOV lanes	Construction emissions and increased noise from freeways

Construction Noise Impacts Related to Transportation Control Measures

PROJECT SPECIFIC IMPACTS: Some of the Transportation Control Measures including TCM 4 – Upgrade and Expand Local and Regional Rail Service, TCM 5 – Improve Access to Rails and Ferries, TCM 6 - Improve Interregional Rail Service, TCM 7 – Improve Ferry Service and TCM 8 – Construct Carpool/Express Bus Lanes on Freeways have the potential to generate significant construction noise impacts. Such activity would generate localized, short-term noise impacts from excavation, pile driving, grading, hauling, concrete pumping, and a variety of other activities requiring the operation of heavy equipment. Construction noise mitigation is normally required by Caltrans, as well as local city and county ordinances. Construction mitigation measures generally limit construction activities to times when construction noise would have the least effect on adjacent land uses, and would require such measures as properly muffling equipment noise, and turning off equipment when not in use. The mitigation measures

would be expected to reduce potentially significant construction-related noise impacts to below the significance criteria so that no significant noise impacts would be expected.

Conclusion: Standard construction noise reduction devices and compliance with local city and county ordinances are expected to ensure construction-related noise impacts associated with the 2005 Ozone Strategy are less than significant.

PROJECT-SPECIFIC MITIGATION: No significant impacts due to noise from construction activities related to the 2005 Ozone Strategy are expected, therefore, mitigation measures are not required.

Operational Noise Impacts Related to Transportation Control Measures

PROJECT SPECIFIC IMPACTS: Direct noise impacts associated with TCM 4 – Upgrade and Expand Local and Regional Rail Service, TCM 5 – Improve Access to Rails and Ferries, TCM 6 - Improve Interregional Rail Service, TCM 7 – Improve Ferry Service, and TCM 8 – Construct Carpool/Express Bus Lanes on Freeways, would result in new transit lines (noise and ground borne vibrations), widening of freeways which brings noise closer to sensitive land uses, addition of new lanes that result in high traffic volumes and speeds, and concentrating vehicle traffic near terminals. A project-level noise analysis may identify potentially significant noise impacts depending on the project, the existing or future land use, and the location of sensitive receptors in relation to the project.

Conclusion: Operational noise impacts related to TCMs 4, 5, 6, 7, and 8 in the 2005 Ozone Strategy are potentially significant.

PROJECT-SPECIFIC MITIGATION: Mitigation Measure N1 below was required by the WTA for TCM 7 – Improve Ferry Service and should be included for TCM 4 – Upgrade and Expand Local and Regional Rail Service, TCM 5 – Improve Access to Rails and Ferries, TCM 6 - Improve Interregional Rail Service, and TCM 8 – Construct Carpool/Express Bus Lanes on Freeways:

N1 Siting and planning of new terminals shall include planning to locate terminal areas away from noise-sensitive land uses. Compliance with existing zoning ordinances should be sufficient to mitigate any potential impacts of ferry terminal operations.

The following mitigation measures should be evaluated and implemented for all TCMs that are determined to have potentially significant impacts through project specific environmental analysis:

N2 Construction of sound walls adjacent to new or improved roads or transit lines. Noise level increases could, in most cases, be mitigated to levels at or below existing levels if sound walls were constructed along the rights-of-way. A determination of the specific heights, lengths, and feasibility of sound walls must

be part of the project-level environmental assessment. It is likely that Federal Highway Administration noise abatement criteria would be met if sound walls are included as mitigation measures. Where the TCMs would improve existing roadways, sound walls would also result in a reduction of overall sound levels, even considering potential increases from road widenings and additional traffic. As a result, the implementation of this mitigation measure can avoid project noise impacts and reduce existing noise levels along a number of heavily traveled corridors in the region.

N3 Adjustments to proposed roadways or transit alignments to reduce noise levels in noise sensitive areas. For example, depressed roadway or railway alignments can effectively reduce noise levels in nearby areas.

N4 Insulation of buildings to construction or noise barriers around sensitive receptor properties.

N5 Vibration isolation of track segments.

N6 Use of local land use policies by local agencies to guide the location of noise sensitive uses to sites away from roadways and rail corridors.

Implementation of specific TCMs will require project specific environmental analysis. Any potentially significant noise impacts identified would be offset with project specific mitigation measures of a particular transportation improvement. Therefore, noise impacts from implementation of the TCMs listed in Table 3.12-1 are expected to be less than significant following mitigation.

Noise Impacts Related to Stationary Source Control Measures

PROJECT SPECIFIC IMPACTS: The proposed project may require existing commercial or industrial owners/operators of affected facilities to install air pollution control equipment or modify their operations to reduce stationary source emissions. Potential modifications will occur at facilities typically located in appropriately zoned industrial or commercial areas. Ambient noise levels in commercial and industrial areas are typically driven primarily by freeway and/or highway traffic in the area and any heavy-duty equipment used for materials manufacturing or processing at nearby facilities. It is not expected that any modifications to install air pollution control equipment would substantially increase ambient operational noise levels in the area, either permanently or intermittently, or expose people to excessive noise levels that would be noticeable above and beyond existing ambient levels. It is not expected that affected facilities would exceed noise standards established in local general plans, noise elements, or noise ordinances currently in effect.

It is also not anticipated that the proposed control measures will cause an increase in groundborne vibration levels because air pollution control equipment is not typically

vibration intensive equipment. Consequently, the 2005 Ozone Strategy will not directly or indirectly cause substantial noise or excessive groundborne vibration impacts.

Affected facilities would still be expected to comply, and not interfere, with any applicable airport land use plans and disclose any excessive noise levels to affected residences and workers pursuant to existing rules, regulations and requirements, such as CEQA. It is assumed that operations in these areas are subject to, and in compliance with, existing community noise ordinances and applicable OSHA or Cal/OSHA workplace noise reduction requirements. In addition to noise generated by current operations, noise sources in each area may include nearby freeways, truck traffic to adjacent businesses, and operational noise from adjacent businesses.

Conclusion: There are no components of the proposed 2005 Ozone Strategy that would substantially increase ambient noise levels from stationary sources, either intermittently or permanently. Therefore, noise impacts associated with stationary source control measures are expected to be less than significant.

PROJECT-SPECIFIC MITIGATION: No significant impacts due to noise from stationary source control measures are expected, therefore, mitigation measures are not required.

Miscellaneous Noise Impacts

The CEQA environmental checklist includes a discussion of impacts on airports and airport land use plans so discussions of those impacts are included in this section for completeness. Some 2005 Ozone Strategy control measures could apply to facilities within an airport land use plan or within two miles of a public airport or private airstrip. Affected facilities would be expected to comply, and not interfere, with any applicable airport land use plans and disclose any excessive noise levels to affected residences and workers pursuant to existing rules, regulations and requirements, such as CEQA. It is assumed that operations in these areas are subject to and in compliance with existing community noise ordinances and applicable OSHA or Cal/OSHA workplace noise reduction requirements. In addition to noise generated by current operations, noise sources in each area may include nearby freeways, truck traffic to adjacent businesses, and operational noise from adjacent businesses. There are no components of the proposed 2005 Ozone Strategy that would substantially increase ambient noise levels, either intermittently or permanently so that no significant impacts would be expected.

3.12.4 MITIGATION MEASURES

Mitigation measures have been discussed under each subcategory. In summary, mitigation measures were required due to potential increases in noise associated with transportation-related projects. Mitigation measures are expected to reduce potential adverse noise impacts to less than significant.

3.12.5 CUMULATIVE NOISE IMPACTS

Construction phases associated with the 2005 Ozone Strategy control measures and other air quality measures are expected to generate localized, short-term noise impacts. The use of muffling devices, restriction of work hours, etc. is expected to mitigate the increase in noise at most of the construction sites. Further, construction noise levels would be short-term and cease following the construction period so no significant cumulative noise impacts are expected.

Control measures in the 2005 Ozone Strategy for stationary sources will usually occur within commercial of industrial areas that generally have higher allowable noise levels than sensitive land use areas (e.g., residential and schools). Most of the control measures would occur within buildings so that cumulative noise impacts would not be expected.

The control measures in the 2005 Ozone Strategy and other related air quality plans and rules are responding to population growth. The growth in traffic throughout the Bay Area could produce unquantifiable cumulative noise impacts that would increase noise. The cumulative increase in noise related to traffic is a factor of population growth and not associated with air quality control measures. The 2005 Ozone Strategy is responding to the population growth in an attempt to attain and maintain ozone ambient air quality standards. The 2005 Ozone Strategy and other related air quality plans are not expected to generate additional traffic that would generate cumulative noise sources. In fact, the air quality control measures (especially the transportation control measures) are expected to reduce traffic associated with single occupancy vehicles and, thus, reduce the related traffic noise levels. Therefore, the cumulative impact of the proposed project and other related projects are not expected to result in significant adverse noise impacts.

3.13 POPULATION AND HOUSING

3.13.1 ENVIRONMENTAL SETTING

The Bay Area's population has increased by 90 percent over the previous 40 years, while jobs have increased 200 percent. Looking ahead to the next 25 years, ABAG projects that the Bay Area's population will grow another 18.5 percent (1.3 million more residents) and employment will increase by another 33 percent (1.2 million additional jobs).

During the past 40 years, the location of people and jobs have become much more dispersed as new urban centers have formed and cities have gained population on the edge of the region. This shift in growth patterns is illustrated in Table 3.13-1. Santa Clara County is now the most populous county in Bay Area, and is home to about 25 percent of the region's residents. The county's largest city, San Jose, is also the largest city in the Bay Area with a population of 895,000. Currently, there are 12 cities in the Bay Area with more than 100,000 residents (MTC, 2001).

TABLE 3.13-1
Population Growth in the Bay Area (1980 – 2025)

County	1980	2000	2025	Growth: 1980 - 2000	Growth: 2000 - 2025
Alameda	1,105,379	1,462,695	1,701,599	357,316	238,904
Contra Costa	656,380	941,900	1,213,899	285,520	271,999
Marin	222,568	250,402	278,401	27,834	27,999
Napa	99,199	127,600	165,601	28,401	38,001
San Francisco	678,984	799,009	804,804	120,035	5,795
San Mateo	587,329	737,095	823,901	149,766	89,806
Santa Clara	1,295,071	1,755,333	2,062,906	460,262	307,573
Solano	235,203	401,300	581,400	166,097	180,100
Sonoma	299,681	455,305	591,597	155,624	136,292
Region	**5,179,784**	**6,930,639**	**8,224,108**	**1,750,855**	**1,293,469**

Source: Metropolitan Transportation Commission, 2001.

3.13.2 SIGNIFICANCE CRITERIA

The impacts of the proposed project on population and housing will be considered significant if the following criteria are exceeded:

The demand for temporary or permanent housing exceeds the existing supply.

The proposed project produces additional population, housing or employment inconsistent with adopted plans either in terms of overall amount or location.

3.13.3 ENVIRONMENTAL IMPACTS

This subchapter evaluates impacts on population and housing that could occur as a consequence of efforts to improve air quality. As discussed below, no control measures were identified that are expected to result in impacts to population and housing.

The proposed 2005 Ozone Strategy stationary source control measures generally affect existing commercial or industrial facilities located in predominantly industrial or commercial urbanized areas throughout the Air District. It is expected that the existing labor pool within the Bay Area would accommodate the labor requirements for any modifications at affected facilities. In addition, it is not expected that affected facilities will be required to hire additional personnel to operate and maintain new control equipment on site because air pollution control equipment is typically not labor intensive equipment. In the event that new employees are hired, it is expected that the existing local labor pool in the Air District can accommodate any increase in demand for workers that might occur as a result of adopting the proposed 2005 Ozone Strategy. As such, adopting the proposed 2005 Ozone Strategy is not expected to result in changes in population densities or induce significant growth in population.

Some of the TCMs are largely in response to population growth in order to provide additional roadways, railways and expressways, and carpools to transport the anticipated increase in population in an effective manner. To the extent that improved transportation attracts population growth to the area, the control measures could have an impact on population growth. However, the control measures themselves are not expected to provide housing or jobs that would attract more population to the area.

Some of the TCMs could result in impacts related to the displacement or relocation of homes and businesses as well as community disruption. In some cases, buildings on residential, commercial, and industrial land may have to be removed in order to make way for new or expanded transportation facilities. In other cases, certain transportation projects could permanently alter the characteristics and quality of a neighborhood. These impacts are considered speculative at this point and will need to be considered as the TCMs are proposed and developed in their project specific CEQA documents.

Because of the region's available workforce, history of mobility and existing patterns whereby individuals do not typically live close to their workplaces, any demand for new employees can be accommodated from the local region so no substantial population displacement is expected. Therefore, construction of replacement housing elsewhere in the Air District is not anticipated.

Conclusion: Based upon the above considerations, significant adverse impacts to population and housing are not expected due to implementation of the control measures within the 2005 Ozone Strategy.

3.13.4 MITIGATION MEASURES

No significant impacts to population and housing are expected so no mitigation measures are required.

3.13.5 CUMULATIVE POPULATION AND HOUSING IMPACTS

Some of the TCMs are largely in response to population growth in order to provide additional / expanded alternatives to travel other than the single occupant vehicle. To the extent that improved transportation, and ultimately air quality, attracts population growth to the area, the control measures could have an impact on population growth. However, the control measures themselves are not expected to provide housing or jobs that would attract more population to the area inconsistent with adopted plans. Therefore, the cumulative impacts on population and housing are considered less than significant.

CUMULATIVE POPULATION AND HOUSING MITIGATION MEASURES: No significant cumulative impacts on population and housing were identified so no mitigation measures are required.

3.14 PUBLIC SERVICES

3.14.1 ENVIRONMENTAL SETTING

Given the large area covered by the BAAQMD that includes all or parts of nine counties, public services are provided by a wide variety of local agencies. Fire protection and police protection/law enforcement services within the BAAQMD are provided by various districts, organizations, and agencies. There are several public and private school districts, and park and recreation departments within the BAAQMD. Public facilities within the BAAQMD are managed by different county, city, and special-use districts.

3.14.2 SIGNIFICANCE CRITERIA

Impacts on public services will be considered significant if:

> The project results in substantial adverse physical impacts associated with the provision of new or physically altered governmental facilities, or
>
> The need for new or physically altered government facilities, the construction of which could cause significant environmental impacts, in order to maintain acceptable service ratios, response time or other performance objectives.

3.14.3 ENVIRONMENTAL IMPACTS

There is no potential for significant adverse public service impacts as a result of adopting the proposed 2005 Ozone Strategy. The proposed project would not result in the need for new or physically altered government facilities in order to maintain acceptable service ratios, response times or other performance objectives. No additional need for fire or police services would be expected. Better transportation systems and increased use of public transportation could reduce the number of traffic accidents and decrease the need for police services on freeways/roadways.

Adopting the proposed 2005 Ozone Strategy control measures would not induce population growth or alter the distribution of existing population. Thus, implementing the 2005 Ozone Strategy control measures would not increase or otherwise alter the demand for schools and parks in the Air District. No significant adverse impacts to schools or parks are foreseen as a result of adopting the proposed 2005 Ozone Strategy.

Conclusion: Based upon the above evaluation and the significance criteria, adopting the proposed 2005 Ozone Strategy is not expected to create significant adverse public service impacts.

3.14.4 MITIGATION MEASURES

No significant impacts to public services are expected so no mitigation measures are required.

3.14.5 CUMULATIVE PUBLIC SERVICES IMPACTS

The control measures contained in the 2005 Ozone Strategy are largely in response to population growth in order to provide alternatives to single occupant vehicles to transport the existing population and anticipated population of the area in an effective manner and with less air emissions. Control measures in the 2005 Ozone Strategy and other air quality rules, regulations and plans, are not expected to require additional fire, police or other public services. Therefore, no significant adverse cumulative impacts on public services are expected.

CUMULATIVE PUBLIC SERVICES MITIGATION MEASURES: No significant cumulative impacts on public services were identified so no mitigation measures are required.

3.15 RECREATION

3.15.1 ENVIRONMENTAL SETTING

The BAAQMD includes covers all of Alameda, Contra Costa, Marin, San Francisco, San Mateo, Santa Clara, and Napa Counties and portions of southwestern Solano and southern Sonoma Counties. Numerous recreational opportunities are available throughout the Bay Area. The facilities affected by the proposed control measures are expected to be located in urban centers within the Bay Area. Public recreational land uses are located throughout the Bay Area, but generally not within the confines of the commercial and industrial areas.

3.15.2 SIGNIFICANCE CRITERIA

The impacts to recreation will be considered significant if:

> The project results in an increased demand for neighborhood or regional parks or other recreational facilities.
>
> The project adversely affects existing recreational opportunities.

3.15.3 ENVIRONMENTAL IMPACTS

This subchapter evaluates impacts on recreation. As discussed below, no control measures were identified that are expected to result in impacts to recreation.

As discussed under “Land Use and Planning” above, there are no provisions in the proposed control measures which would affect land use plans, policies, ordinances, or regulations. Land use and other planning considerations are determined by local governments. No land use or planning requirements, including those related to

recreational facilities, will be altered by the proposed project. The proposed control measures do not have the potential to directly or indirectly induce population growth or redistribution. As a result, the proposed control measures would not increase the use of, or demand for existing neighborhood and/or regional parks, or other recreational facilities, or require the construction or expansion of recreational facilities that might have an adverse physical effect on the environment.

Conclusion: Based upon the above considerations, significant adverse impacts to recreation are not expected due to implementation of the control measures within the 2005 Ozone Strategy.

3.15.4 MITIGATION MEASURES

No significant adverse impacts to recreation are expected so no mitigation measures are required.

3.15.5 CUMULATIVE RECREATIONAL IMPACTS

No project specific impacts on recreational activities are expected. The potential increase for recreational activities associated with other air quality rules, regulations and plans are not expected since these measures usually do not result in land use changes and changes in recreational opportunities. Therefore, no significant cumulative impacts on recreational activities are expected.

CUMULATIVE RECREATIONAL MITIGATION MEASURES: No significant adverse cumulative impacts on recreation were identified so no mitigation measures are required.

3.16 TRANSPORTATION AND TRAFFIC

3.16.1 ENVIRONMENTAL SETTING

Transportation systems located within the Bay Area include railroads, airports, waterways, and highways. The Port of Oakland and three international airports in the area serve as hubs for commerce and transportation. The transportation infrastructure for vehicles and trucks in the Bay Area ranges from single lane roadways to multilane interstate highways. The Bay Area contains over 19,600 miles of local streets and roads, and over 1,400 miles of state highways. In addition, there are over 9,040 transit route miles of services including rapid rail, light rail, commuter, diesel and electric buses, cable cars, and ferries. The Bay Area also has an extensive local system of bicycle routes and pedestrian paths and sidewalks. At a regional level, the share of workers driving alone was about 68 percent in 2000. The portion of commuters that carpool was about 12.9 percent in 2000. About 3.2 percent of commuters walked to work in 2000. In addition,

other modes of travel (bicycle, motorcycle, and other) account for 2.2 percent of commuters in 2000 (MTC, 2004).

Cars, buses, and commercial vehicles travel about 143 million miles a day (2000) on the Bay Area Freeways and local roads. Transit serves about 1.7 million riders on the average weekday (MTC, 2004).

The region is served by numerous interstate and U.S. freeways. On the west side of San Francisco Bay, Interstate 280 and U.S. 101 run north-south. U.S. 101 continues north of San Francisco into Marin County. Interstates 880 and 660 run north-south on the east side of the Bay. Interstate 80 starts in San Francisco, crosses the Bay Bridge, and runs northeast toward Sacramento. State Routes 29 and 84, both highways that allow at-grade crossings in certain parts of the region, become freeways that run east-west and cross the Bay. Interstate 580 starts in San Rafael, crosses the Richmond-San Rafael Bridge, joins with Interstate 80, runs through Oakland, and then runs eastward toward Livermore.

Projected population and employment growth in the Bay Area will lead to further travel demand. Total person trips are projected to increase by 35 percent by 2025. This growth rate is higher than population growth, projected at 29 percent, but lower than the growth of employment (38 percent) (MTC, 2004).

There will also be substantial growth in trips from neighboring counties to the Bay Area as they increasingly supply homes for Bay Area workers, who are unable to find affordable housing in the nine counties. There are three major gateways with significant interregional trips: (1) San Joaquin Valley (Altamont Pass); Interstate 80 (Sacramento); and Route 17 (Santa Cruz). Emerging gateways into the Bay Area include U.S.Highway 101 South (San Benito and Monterey counties). In addition, Route 152 (San Joaquin County to Santa Clara County is a major commercial truck route from the San Joaquin Valley into the Bay Area, and Route 4 access the Central Valley as well.

The facilities affected by the proposed control measures are expected to be located in the commercial and industrial areas within the Bay Area and are accessed via highways and local roadway systems. Transportation modes includes vehicles, transit, bicycle and pedestrian.

3.16.2 SIGNIFICANCE CRITERIA

The impacts on transportation/traffic will be considered significant if any of the following criteria apply:

> Peak period levels on major arterials are disrupted to a point where level of service (LOS) is reduced to E or F for more than one month.
>
> An intersection's volume to capacity ratio increases by 0.02 (two percent) or more when the LOS is already E or F.

A major roadway is closed to all through traffic, and no alternate route is available.

There is an increase in traffic that is substantial in relation to the existing traffic load and capacity of the street system.

The demand for parking facilities is substantially increased.

Water borne, rail car or air traffic is substantially altered.

Traffic hazards to motor vehicles, bicyclists or pedestrians are substantially increased.

3.16.3 ENVIRONMENTAL IMPACTS

Table 3.16-1 lists the control measures associated with the 2005 Ozone Strategy with potential transportation and traffic impacts.

Adopting the proposed 2005 Ozone Strategy is expected to reduce vehicle trips and vehicle miles traveled in the Air District. Included as part of the proposed 2005 Ozone Strategy are transportation control measures. These transportation control measures include strategies to enhance mobility by reducing congestion through transportation infrastructure improvements, mass transit improvements, increasing telecommunications products and services, enhanced bicycle and pedestrian facilities, etc. Specific strategies that serve to reduce vehicle trips and vehicle miles traveled, such as strategies resulting in greater reliance on mass transit, ridesharing, telecommuting, etc., are expected to result in reducing traffic congestion. Although population in the Bay Area is expected to increase, implementing the transportation control measures will ultimately result in a greater percentage of the population using alternative transportation modes. Therefore, existing traffic levels and the level of service designation for intersections District-wide, would not be expected to decline at current rates, but are expected to improve (relative to population growth). Therefore, implementing the 2005 Ozone Strategy could ultimately provide transportation improvements and congestion reduction benefits over existing conditions and the No Project Alternative.

TABLE 3.16-1

Control Measures with Potential Transportation/Traffic Impacts

Control Measures	Control Measure Description	Control Methodology	Impact
TCM 1	Support Voluntary Employer-Based Trip Reduction Programs	Support and encourage voluntary efforts by Bay Area employers to promote the use of commute alternatives by their employees	Localized increase in traffic in areas near transit stations
TCM 3	Improve Local and Areawide Bus Service	Add on control devices (particulate traps and NOx catalysts), alternative clean fuels and bus service improvements	Localized increase in traffic near bus transit stations
TCM 4	Improve Regional Rail Service	Construction of new rail facilities, rail electrification	Localized increase in traffic near rail stations
TCM 6	Improve Interregional Rail Service	Construction of new rail facilities	Localized increase in traffic near rail stations
TCM 7	Improve Ferry Service	Construction of new facilities, use of low emission ferries, and add-on controls	Increase in traffic near ferry terminals
TCM 9	Improve Bicycle Access and Facilities	Construction of additional bicycle lanes	Increase potential conflicts between vehicle and bicycle traffic
TCM 11	Install Freeway Traffic Management Systems	Include traffic management features into new freeway projects and extend ramp metering to major freeway corridors	Potential localized increase in traffic on streets leading to freeway on-ramps
TCM 15	Local Land Use Planning and Development Strategies	Includes various indirect source mitigation measures	Localized increase in traffic in areas of higher density development (e.g., near transit stations and corridors)
TCM 20	Promote Traffic Calming	Includes various measures to increase pedestrian traffic and decrease the use of mobile sources	Traffic reductions on some streets may lead to more traffic on other streets without any traffic claming measures

Although overall the 2005 Ozone Strategy is anticipated to reduce vehicle miles traveled compared to the existing baseline and No Project Alternative, some control measures could encourage higher densities in localized areas (e.g., TCM 1 - Support Voluntary Employer-Based Trip Reduction Programs, TCM 3 - Improve Local and Areawide Bus Service, TCM4 - Improve Regional Rail Service, TCM 6 - Improve Interregional Rail Service, TCM 7 – Improve Ferry Service, TCM 11 - Install Freeway Traffic Management Systems, and TCM 15 – Local Land Use Planning and Development Strategies). The impacts of individual projects are potentially significant and would need to be evaluated on a project-by-project basis by the local jurisdiction. Traffic studies would be required to determine if the existing street/road systems in the area can handle the proposed development, or if other means, such as roadway expansion, or increased alternative

transportation options, etc., would be required. TCM 15 – Local and Land Use Planning and Development Strategies seeks to reduce motor vehicle use and emissions by promoting land use patterns and development projects that facilitate walking, bicycling and transit use for a higher percentage of personal trips, sometimes referred to as smart growth. TCM 15 also includes measures that would reduce traffic within mixed-use development including providing pedestrian pathways, providing transit benches and shelters, providing bicycle infrastructure (e.g., bike racks), providing bike routes, etc. On balance, an overall decrease in vehicle miles traveled and transportation impacts would be anticipated regionally; however, TCM 15 would concentrate traffic in specific areas and significant adverse traffic impacts could occur locally. New development would need to comply with the local land use policies and regulations with regard to density and their related impact on the transportation systems.

TCM 7 – Improve Ferry Service would expand ferry service in the Bay Area reducing the total vehicle miles traveled by automobiles. The impacts related to this control measure were evaluated in a previously prepared Final Program EIR, Expansion for Ferry Transit Service in the San Francisco Bay Area, State Clearinghouse No. 2001112048 (WTA, 2003). Per CEQA Guidelines §15150, the description of the impacts and mitigation measures for that project are incorporated by reference. Copies of the Final Program EIR for the Expansion for Ferry Transit Service can be downloaded at http://www.watertransit.org/eir_download.shtml.

TCM 7 - Improve Ferry Service is expected to result in a 0.07 percent reduction in automobile vehicle miles traveled in the Bay Area (WTA, 2003). Due to the increase in ferry riders of an estimated 13,736, expanded ferry service is expected to result in an increase in access to terminals by riders. Of the estimated 36,974 daily riders, it is projected that 65 percent would access the terminals by car, 15 percent by bus or rail, and 20 percent on foot. With a 65 percent total access to terminals by car and a 13,376 increase in total daily riders, an estimated 8,928 new riders could be accessing ferry terminals by automobiles. There could also be an increase in bus access to ferry terminals. The increase in riders accessing the ferry terminals in cars could alter traffic circulation patterns in localized areas near the ferry terminals. The traffic impacts are considered potentially significant, where access and circulation are not adequate to accommodate riders attracted to the terminal and system (WTA, 2003).

TCM 1 - Support Voluntary Employer-Based Trip Reduction Programs, TCM 3 - Improve Local and Areawide Bus Service, TCM 4 - Improve Regional Rail Service, and TCM 6 - Improve Interregional Rail Service, could result in increased congestion in the vicinity of transportation terminals. An increase in individuals using rail and bus transport will result in an increase in the number of individuals that travel to rail and bus terminals. The increase in riders accessing the rail and bus terminals in cars could alter traffic circulation patterns in localized areas near the terminals. The traffic impacts are considered potentially significant, where access and circulation are not adequate to accommodate riders attracted to the terminal system.

Additional automobiles accessing existing and new ferry, rail and bus terminals would require parking. This could result in potential localized parking problems and conflicts in the vicinity of the terminals. Parking demand could exceed parking availability at some locations. Other control measures in the 2005 Ozone Strategy are not anticipated to result in inadequate parking at any affected facilities. The reason for this conclusion is that, to the extent that transportation and related control measures reduce or limit the growth in daily vehicle trips or charge additional parking fees, there could be a slight reduction in current or future demand for parking on a regional basis compared to existing levels of parking demand. However, the potential increase in parking demand near rail, bus, and ferry terminals is considered significant.

TCM 4 – Upgrade and Expand Local and Regional Rail Service and TCM 5 – Improve Access to Rails and Ferries could also result in a decrease in vehicle miles traveled on a regional basis by encouraging the use of mass transit (e.g., rails and ferries).

TCM 9 - Improve Bicycle Access and Facilities could increase potential conflicts between vehicle and bicycle traffic by increasing the number of people bicycling near transit terminals. TCM 9 also supports local efforts to provide bicycle access and amenities and to better integrate bicycles into roadway improvement and Caltrans' efforts to consider non-motorized travel in all their plans, programs, and projects. As new facilities are developed, consideration will need to be given to the potential conflicts between vehicles and bicycles. The development of bicycle lanes and physical separation between bicycle and vehicle lanes would help minimize the potential for conflicts.

Conclusion: Based upon the above considerations, some control measures in the 2005 Ozone Strategy could encourage higher traffic densities in localized areas (e.g., TCM 1, TCM 3, TCM4, TCM 6, TCM 7, TCM 11, and TCM 15). The impacts of individual projects are potentially significant and would need to be evaluated on a project-by-project basis. The potential increase in parking demand near rail, bus, and ferry terminals is also considered significant.

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Miscellaneous Traffic/Transportation Issues

The CEQA environmental checklist includes a discussion of air traffic impacts, emergency access and the potential conflicts with adopted policies, plans and programs, so the following discussion is provided. Neither air traffic nor air traffic patterns are expected to be directly or indirectly affected by adopting the proposed 2005 Ozone Strategy. Controlling emissions at existing commercial or industrial facilities, and developing TCMs, do not require constructing any structures that could impede air traffic patterns in any way.

It is not expected that adopting the proposed 2005 Ozone Strategy will directly or indirectly increase roadway design hazards or incompatible risks. New roadway improvements would be constructed to the most recent State and federal rules and regulations so that traffic hazards are expected to be minimized. TCM 20 – Promote Traffic Calming Measures is expected to reduce traffic hazards, as traffic calming

measures include developing streets exclusively for pedestrians, reducing speeds through residential neighborhoods, limiting vehicle speeds on arterials and major routes, and enhancing pedestrian and bicycling access to areas.

Controlling emissions at existing commercial or industrial facilities are not expected to affect in any way emergency access routes at any affected commercial or industrial facilities. The reason for this conclusion is that the process of controlling emissions (from stationary sources in particular) is not expected to require construction of any structures that might obstruct emergency access routes at any affected facilities.

Adopting the proposed 2005 Ozone Strategy will not conflict with adopted policies, plans or programs supporting alternative transportation programs. In fact, the transportation and related control measures would specifically encourage and provide incentives for implementing alternative transportation programs and strategies.

3.16.4 MITIGATION MEASURES

The following mitigation measures are required to mitigate the potential increased car and bus traffic to and from new and existing transportation terminals and stations, including TCM 1 - Support Voluntary Employer-Based Trip Reduction Programs, TCM 3 - Improve Local and Areawide Bus Service, TCM 4 - Improve Regional Rail Service, TCM 6 - Improve Interregional Rail Service, TCM 7 - Improve Ferry Service, and TCM 15 - Local Land Use Planning and Development Strategies.

T1 Once transport terminal and station locations are narrowed down, site specific traffic analyses shall be conducted to compare predicted traffic with applicable local LOS standards. Traffic analyses must also be completed where modifications are proposed for existing terminals and stations. Traffic mitigation measures would depend on site-specific conditions, including design of vehicular access to terminals, major access routes, parking availability, and traffic patterns. For example, impacts that were predicted to occur at intersections could be mitigated by addition of turning lanes. For some cases, where access is problematic or presents serious community concerns, the viability of the terminal location would need to be further evaluated.

T2 The project proponents, in conjunction with local and regional transit agencies, shall study and develop terminal-specific plans to ensure that potential driving patrons can be adequately served by transit in locations with limited parking and currently insufficient transit access.

T3 Non-drive access could be encouraged through measures such as charging fees for parking, provision of preferential parking for carpools and vanpools, comprehensive shuttle access, land use scenarios that encourage non-drive access, and encouraging bicycle and pedestrian access.

In addition to the above mitigation measures, TCM 9 – Improve Bicycle Access and Facilities and TCM 19 – Improve Pedestrian Access and Facilities, should also help to minimize localized impacts on traffic. Impacts after mitigation must be determined on a case-by-case basis after mitigation measures are considered. Therefore, the impact on traffic and parking in the vicinity of new transit remains potentially significant.

3.16.5 CUMULATIVE TRANSPORTATION/TRAFFIC IMPACTS

The forecast for the Bay Area includes a significant increase in population with a related significant increase in traffic (vehicles miles traveled) in the Bay Area over the next 25 years. While general population growth may impact transportation and traffic, the 2005 Ozone Strategy, along with other air quality policies and programs, have been developed as strategies for attaining and maintaining compliance with ambient air quality standards in response to this population growth.

The cumulative affect of the 2005 Ozone Strategy and other air quality rules, regulations, and programs are expected to result in a reduction in vehicle miles traveled in the Bay Area as compared to the No Project Alternative or the baseline, thus providing beneficial impacts to the transportation system. Localized impacts, as discussed in the project-specific impacts above may occur. However, on a cumulative basis, the 2005 Ozone Strategy is expected to result in a reduction in vehicle miles traveled, therefore, no significant adverse cumulative impacts on transportation and traffic are expected.

3.17 UTILITIES AND SERVICE SYSTEMS

3.17.1 ENVIRONMENTAL SETTING

The BAAQMD covers all of Alameda, Contra Costa, Marin, San Francisco, San Mateo, Santa Clara, and Napa Counties and portions of southwestern Solano and southern Sonoma Counties. Given the large area covered by the BAAQMD, public utilities are provided by a wide variety of local agencies.

3.17.1.1 Electricity

The electricity market in California was restructured under Assembly Bill 1890 (AB 1890), which was signed into law in 1996. Restructuring involved decentralizing the generation, transmission, distribution and customer services, which had previously been integrated into individual, privately-owned utilities. The objective of restructure was to increase competition in the power generation business, while increasing customer choice through the Power Exchange (PX). Additionally, the goal was to release control by privately-owned utilities of their transmission lines to a central operator called the Independent System Operator (ISO). Publicly-owned utilities provide electric service to approximately one-quarter of the state's population. AB 1890 states the Legislature's intention that the State's publicly-owned utilities voluntarily give control of their transmission facilities to the ISO, just as is required of the privately-owned utilities.

However, changes instituted by AB 1890 do not apply to them to the same extent as the privately-owned utilities. In-State, power plants supply most of California's electricity demand, while hydroelectric power plants from the Pacific Northwest, and power plants in the southwestern U.S., provide for California's out-of-state needs. The contribution between in-state and out-of-state power plants depends upon, among other factors, the precipitation that occurred in the previous year and the corresponding amount of hydroelectric power that is available. The two largest power plants in the Bay Area are located in Contra Costa County. Both of these plants consume natural gas, and provide over 1400 Mega Watts (MW) of electricity. Additionally, a 600 MW facility is under construction in Santa Clara County, and is scheduled to open in the summer of 2005 (CEC, 2004). Local electricity distribution service is provided to customers within the Air District by privately-owned utilities such as Pacific Gas and Electric (PG&E). Many public-owned utilities, such as Alameda Power and Telecom, East Bay Municipal Utility District and the Santa Clara Electric Department also provide service. PG&E is the largest electricity utility in the Bay Area, with a service area that covers all, or nearly all, of Alameda, Contra Costa, Marin, Napa, San Francisco, San Mateo, Santa Clara, Solano, and Sonoma counties. PG&E provides approximately 94 percent of the total electricity demand in the Air District (CEC, 2001).

There are local reliability concerns in the San Francisco Area. Unless generation is added, or transmission upgrades are performed, local reliability criteria for the San Francisco peninsula will be exceeded as soon as 2006 (CEC, 2003). In addition, Hunters Point Power Plant (HPPP), a forty-five year old unit, and Potrero Power Plant, a forty year old unit, are in the process of being shut down (CAISO, 2005).

The ISO Governing Board first approved the Action Plan for San Francisco ("Action Plan") on November 10, 2004. The Action Plan specifies the new projects necessary, including generation and transmission, to facilitate the release of existing generation located within the City of San Francisco from the applicable Reliability Must Run ("RMR") Agreements with the ISO. Based on the current projected completion dates for the various transmission and generations projects, the release of the Hunters Point Power Plant ('Hunters Point") and the Potrero Power Plant ("Potrero") units from the RMR Agreements, which will allow the plants to close, is as follows:

Unit	Release Date
Hunters Point Units 2 & 3	Completed
Hunters Point Units 1 & 4	March 2006
Potrero Unit 3	December 2007
Potrero Units 4, 5, & 6	December 2007

Source: CAISO, 2005

The proposed schedule to shutdown HPPP and Potrero Power Plant assumes the sequential completion of certain transmission and power generation projects. If a project is not completed on schedule, then the shutdown of the units may be delayed.

Table 3.17-1 shows the amount of electricity delivered to residential and nonresidential entities in the counties in the BAAQMD in 2000 (CAISO, 2005).

TABLE 3.17-1

Bay Area Utility Electricity Deliveries for 2000 by County

	Residential		Non-Residential		Total	
County	**Number of Accounts**	**kWh[1] (million)**	**Number of Accounts**	**kWh (million)**	**Number of Accounts**	**KWh (million)**
Alameda	507,929	3,066	53,839	7,539	561,768	10,605
Contra Costa	341,2761	2,761	29,705	4,054	371,426	6,815
Marin	99,628	734	13,489	834	113117	1568
Napa	45,477	366	7,671	618	53,148	984
San Francisco	312,258	1,481	31,862	4,267	344,120	5,748
San Mateo	253,893	1,661	26,191	3,474	280,084	5,135
Santa Clara	555,775	3,990	60,054	13,853	615,829	17,843
Solano	126,607	984	14,023	2,088	140,630	3,071
Sonoma	171,448	1,258	24,367	1,735	195,815	2,993

Source: CEC, 2002

[1] kilowatt-hour (kWh): The most commonly used unit of measure telling the amount of electricity consumed over time. It means one kilowatt (1000 watts) of electricity supplied for one hour.

3.17.1.2 Natural Gas

Four regions supply California with natural gas. Three of them—the Southwestern U.S., the Rocky Mountains, and Canada—supply 85 percent of all the natural gas consumed in California. The remainder is produced in California. In 2000, approximately 35 percent of all the natural gas consumed in California was used to generate electricity. Residential consumption represented approximately one-fourth of California's natural gas use with the balance consumed by the industrial, resource extraction, and commercial sectors. PG&E provides natural gas service throughout the Bay Area (CEC, 2002a). CEC staff expects that PG&E will need to expand its pipeline capacity to access Canadian supplies by 2013 to meet the projected natural gas demand (CEC, 2003a).

Table 3.17-2 provides the estimated use of natural gas in California by residential, commercial and industrial sectors in 2000. About 71 percent of the natural gas consumed in California is for industrial and electric generation purposes.

The estimated energy use associated with transportation in California and the Bay Area is included in Table 3.17-3

TABLE 3.17-2

California Natural Gas Consumption for 2000

Sector	Utility	Non-Utility	Total
Residential	1,381	--	1,381
Commercial	505	--	505
Industrial	1,327	1,044	2,371
Electric Generation	2,281	45	2,326
Total	**5,495**	**1,089**	**6,584**

Source: CEC, 2002a

TABLE 3.17-3

Transportation Energy Use in California and the Bay Area (2000)

Fuel Type	Units	State	Bay Area	Bay Area % of Statewide Demand
Gasoline/Diesel	Million gallons	14,378	3,159	22
Electricity	Million kW-hr	505	416	82
Natural Gas	Million therms	34	5	15

Source: WTA, 2003

3.17.1.3 Solid/Hazardous Waste

Solid Waste

Permit requirements, capacity, and surrounding land use are three of the dominant factors limiting the operations and life of landfills. Landfills are permitted by the local enforcement agencies with concurrence from the California Integrated Waste Management Board (CIWMB). Local agencies establish the maximum amount of solid waste which can be received by a landfill each day and the operational life of a landfill. Landfills are operated by both public and private entities (CIWMB, 2002a).

There are three primary classes of landfill sites permitted to receive varying severity of waste materials. Class I sites are facilities that can accept hazardous waste as well as municipal solid waste, construction debris, and yard waste. Class II sites may receive certain designated waste along with municipal solid waste, construction debris, and yard waste. Class III sites can only accept non-hazardous waste, e.g., solid waste construction debris, wood and yard waste, and certain non-hazardous industrial waste.

A total of 21 Class III active landfills are located within the Air District with a total capacity of 52,517 tons per day (see Table 3.17-4). More detailed information on each landfill is in Appendix C.

TABLE 3.17-4

Number of Class III Landfills Located within the Bay Area and Related Landfill Capacity

County	Number of Landfills	Capacity (tons/day)
Alameda[(1)]	3	16,014
Contra Costa	3	7,500
Marin	2	2,375
Napa	1	300
San Mateo	2	3,998
Santa Clara	7	13,100
Solano	2	6,730
Sonoma	1	2,500
TOTAL	21	52,517

(1) Sources: California Integrated Waste Management System. See Appendix C for further details.

In addition, there are a total of 16 green waste composting facilities in the Bay Area (see Appendix C for further details).

Hazardous Waste

There are two hazardous waste (Class I) facilities in California, the Chemical Waste Management Inc. (CWMI) Kettleman Hills facility in King's County, and the Safety-Kleen facility in Buttonwillow (Kern County). Kettleman Hills has an estimated nine million cubic yard capacity (four million currently, with an additional five million expected upon completion of a berm expansion). The facility expects to continue receiving wastes for approximately nine years under its current permit. The facility is in the process of permitting a new landfill that would extend the life of the operation another 15 years. (Personal Communication, Terry Yarbough, Chemical Waste Management Inc., June 2004). Buttonwillow receives approximately 960 tons of hazardous waste per day and has a remaining capacity of approximately nine million cubic yards. The expected life of the Buttonwillow Landfill is approximately 40 years (Personal Communication, Marianna Buoni, Safety-Kleen (Buttonwillow), Inc., June 2004).

Hazardous waste also can be transported to permitted facilities outside of California. The nearest out-of-state landfills are U.S. Ecology, Inc., located in Beatty, Nevada; USPCI, Inc., in Murray, Utah; and Envirosafe Services of Idaho, Inc., in Mountain Home, Idaho. Incineration is provided at the following out-of-state facilities: Aptus, located in Aragonite, Utah and Coffeyville, Kansas; Rollins Environmental Services, Inc., located in Deer Park, Texas and Baton Rouge, Louisiana; Chemical Waste Management, Inc., in Port Arthur, Texas; and Waste Research & Reclamation Co., Eau Claire, Wisconsin.

About 611,400 tons of hazardous waste was generated in the nine counties that comprise the Air District in 2003 (see Table 3.17-5). The most common types of hazardous waste generated in the Bay Area include waste oil, other inorganic solid waste, contaminated soils, organic solids, asbestos-containing waste, and unspecified oil-containing wastes. Not all wastes are disposed of in a hazardous waste facility. Many of the wastes generated, including waste oil, are recycled.

TABLE 3.17-5

Hazardous Waste Generation in the Bay Area
(tons per year)

WASTE NAME	Alameda	Contra Costa	Marin	San Francisco	San Mateo	Santa Clara	Napa	Solano[1]	Sonoma[1]
Waste Oil	67,850	2,396	130	813	2,739	17,899	62	9,154	298
Inorganic Solid Waste	12,940	10,047	699	4,369	1,548	7,726	1	1,672	3,265
Contaminated Soils	10,159	71,497	1,310	52,592	2,132	12,219	460	2,193	626
Organic Solids	1,582	6,947	61	457	976	5,930	116	410	264
Asbestos Waste	5,854	4,860	1,039	11,602	2,160	5,968	539	896	663
Oil-Containing Waste	2,030	2,197	34	1,077	933	2,048	39	2,753	129
Unspecified Aqueous Solution	424	191	34	27	118	1,640	15	725	7
Unspecified Solvent Mixture	1,491	331	9	48	285	1,167	12	178	60
Aqueous Solution with Organic Residues	5,683	199	36	60	1,217	4,936	15	5,360	100
Total Waste Generated in County	174,412	140,543	5,099	96,912	39,689	105,402	1,771	36,473	11,100

(1) Data presented is for entire county and not limited to the portion of the county within the Bay Area jurisdiction.
Source: DTSC, 2004.

3.17.2 SIGNIFICANCE CRITERIA

The impacts to utilities/service systems will be considered significant if any of the following criteria are met:

The capacities of existing or proposed wastewater treatment facilities and the sanitary sewer system are not sufficient to meet the needs of the project.

An increase in demand for utilities impacts the current capacities of the electric and natural gas utilities.

The existing water supply does not have the capacity to meet the increased demands of the project, or the project would use a substantial amount of potable water.

The project increases demand for water by more than 300,000 gallons per day.

The generation and disposal of hazardous and non-hazardous waste exceeds the capacity of designated landfills.

3.17.3 ENVIRONMENTAL IMPACTS

The potential impacts on utilities and service systems have been divided into separate sections to discuss the potentially significant impacts on: (1) Energy (electricity, natural gas, petroleum fuels and alternatives fuels); and (2) Solid and hazardous wastes. The impacts for each of these resources are discussed in separate subsections below. Table 3.17-6 lists the 2005 Ozone Strategy control measures that may have potentially significant utilities/service systems impacts.

3.17.3.1 Energy Impacts

Impacts on Electricity

PROJECT-SPECIFIC IMPACTS: The potential increase in electricity use due to implementation of the 2005 Ozone Strategy is associated with the potential installation of add-on control equipment. Several control measures could result in the installation of add-on control equipment including SS 3 – High Emitting Spray Booths and SS 14 – Stationary Gas Turbines. Several other control measures could result in an increase in the use of electric engines including MS 3 – Low Emission Vehicle Incentives, TCM 4 – Improved Regional Rail Service, and TCM 5 – Improved Access to Rails and Ferries.

TABLE 3.17-6

Control Measures with Potential Utilities/Service Systems Impacts

Control Measures	Control Measure Description	Control Methodology	Impact
Energy			
SS 3	High Emitting Spray Booths	Reformulated low-VOC coatings/solvents, add on control devices	Increase in use of electricity or natural gas for add-on control equipment
SS 12	Industrial, Institutional and Commercial Boilers	Low NOx burners	Increased energy use due to boiler turndown, capacity or efficiency
SS 13	Large Water Heaters and Small Boilers	Low NOx burners	Increased energy use due to boiler turndown, capacity or efficiency
SS 14	Stationary Gas Turbines	Add-on control equipment	Increase in use of electricity
MS 3	Low Emission Vehicle Incentives	Purchase low or zero-emission vehicles or engines, engine repowers, retrofits & replacements; add-on control equipment; clean fuels or additives; and alternative fuels	Increase in use of electricity, natural gas, and alternative fuels. Potential savings in petroleum fuel use
TCM 3	Improve Local and Areawide Bus Service	Add on control devices (particulate traps and NOx catalysts), alternative clean fuels	Potential increase in alternative fuels
TCM 4	Improve Regional Rail Service	Construction of new rail facilities, rail electrification	Increase in use of electricity
TCM 5	Improve Access to Rails and Ferries	Construction of new facilities, use of low emission vehicles	Increase in use of electricity and natural gas.
TCM 7	Improve Ferry Service	Construction of new facilities, use of low emission ferries, and add-on controls	Increase in use of alternative fuels (hydrogen). Potential savings in petroleum fuel use
Solid/Hazardous Waste			
SS 3	High Emitting Spray Booths	Reformulated low-VOC coatings/solvents, add on control devices	Potential increase in use of and disposal of activated carbon
SS 8	Marine Loading Operations	Add-on control equipment	Potential increase in use and disposal of activated carbon
SS 10	Pressure Relief Devices	Add-on control equipment	Potential increase in use and disposal of activated carbon
MS 3	Low Emission Vehicle Incentives	Purchase low or zero-emission vehicles or engines, engine repowers, retrofits & replacements; add-on control equipment; clean fuels or additives; and use of alternative fuels	Potential increase in solid/hazardous wastes
MS 4	Vehicle Buy Back Program	Provide financial incentives to scrap vehicles	Potential increase in solid/ hazardous wastes

For stationary sources, the increase in electricity demand is expected to be negligible. Most of the control measures would require natural gas rather than electricity (e.g., incinerators). Alternative processing equipment is expected to be the primary method of control for some of the control measures. For example, the primary method of control for SS 3 – High Emitting Spray Booths is expected to be the increased use of low VOC content products. Further, the primary method of control for other control measures is expected to be replacement of old equipment with newer, more energy efficient equipment, e.g., SS 12 – Industrial, Institutional and Commercial Boilers and SS13 – Large Water Heaters and Small Boilers.

Electrification of mobile sources is expected to increase the electricity use in the Bay Area. Shifting some of the fuel source to electricity will require an additional electrical load. The estimated baseline electricity use in the Air District is about 54,762 million kWh in 2000 (see Table 3.17-1). The CEC estimates that the electricity supply will increase by about four percent within the state between 2004 and 2010 (CEC, 2004b). Assuming the same increase in electricity generation occurs within the Bay Area by 2010, an increase in electricity demand of about 4 percent is expected [(54,762 x 0.04)+54,762 = 56,952 kWh].

Relative to the projected peak electricity demand in 2010, implementation of all the control measures is expected to result in an increase of about one percent of current electrical use in 2010 (see Table 3.17-7).

TABLE 3.17-7

Peak Electricity Demands for the Air District in 2010 (million kWh)

	2010
Baseline	56,952*
Overall Impact	548
Percent of Baseline	>1%

*CEC, 2004b

The electric energy impacts from the implementation of the 2005 Ozone Strategy are expected to be less than significant. The electric energy impacts in Table 3.17-7 represent a conservative estimate of electric energy demand and peak demand impacts. This analysis conservatively includes increases in electricity demand due to the use of add-on controls from coating and solvent control measures. It is expected based on current practices that reformulated products will be used to meet future VOC emission reductions from these control measures. Add-on controls will be used only if they are cost effective. These electricity impacts, although unavoidable, are expected to be less than significant because power-generating utilities are expected to have the capacity to supply the estimated electrical increase.

The Ozone Strategy also includes SS 15 – Promote Energy Conservation, which would have a beneficial air quality impact. This measure would be implemented through a combination of efforts. The BAAQMD will develop a model energy efficiency ordinance and encourage voluntary adoption by local government agencies. In addition, the Air District will conduct a public education program promoting energy efficiency that links energy efficiency with combating air pollution and global warming. The Air District will also explore potential incentives that could be provided to promote project and programs that in addition to reducing air pollution are energy efficient and reduce global warming gases. Quantification of emission reductions from this measure is speculative at this time and would depend on the breadth of implementation and the available funding for implementation.

Conclusion: Based upon the above considerations, significant adverse impacts to electricity generation are not expected due to implementation of the control measures within the 2005 Ozone Strategy.

PROJECT-SPECIFIC MITIGATION: No mitigation measures are required because no significant impacts on electricity demand were identified.

Impacts on Natural Gas

PROJECT-SPECIFIC IMPACTS: Control measures in the 2005 Ozone Strategy may result in an increase in demand for natural gas associated with use as alternative fuels and with add-on controls, e.g, SS 3 – High Emitting Spray Booths, MS 3 – Low Emission Vehicle Incentives, TCM 3 – Improved Local and Areawide Bus Service, and TCM 5 – Improve Access to Rails and Ferries.

Total natural gas (end use) consumption in California is approximately 6,584 million cubic feet per day. The residential, commercial, and industrial sectors account for approximately 21, eight, and 36 percent, respectively, of total statewide natural gas (end use) consumption. Approximately 35 percent of the natural gas used in the state is to generate electricity. The demand for natural gas in California is expected to increase by approximately eight percent from 2003 to 2010 (CEC, 2003).

The Bay Areas may show an increase in natural gas consumption used as an alternative fuel to petroleum fuels. The need for natural gas fueling stations would be required to fuel buses and potentially to fuel motor vehicles. The use of natural gas in buses would displace a portion of the use of diesel fuel in the future, the amount of which will be determined when the number of buses or vehicles that will use natural gas is known.

For stationary sources, a slight increase in natural gas demand is expected from the use of add-on air pollution controls. The amount of natural gas to run these control devices is unknown. All of the industrial facilities affected by these proposed rule amendments currently use fuel gas and/or natural gas. Alternative processing equipment is expected to be the primary method of control, i.e., it is expected based on current practices that

reformulated products will be used to meet some of the future VOC emission reductions from these control measures. Add-on controls will be used only if they are cost effective.

The increased demand in electricity will be generated from the use of natural gas, resulting in an increased demand for natural gas. The increased demand in natural gas associated with the additional electricity demands is expected to be negligible because the increase in electrical demand is negligible.

It is estimated that the control measures will result in a very small increase in natural gas use (i.e., about one percent), which is an extremely small increase relative to the amount of natural gas used in California. In 2010, almost 25,000 million therms of natural gas will be consumed in California. The increase in natural gas use associated with the 2005 Ozone Strategy is expected to be within the statewide projections for natural gas use. The natural gas impacts from the implementation of the Ozone Strategy are expected to be less than significant.

Conclusion: These energy impacts, although unavoidable, are expected to be less than significant because sufficient natural gas capacity and supplies are expected be available. The Ozone Strategy also includes SS 15 – Promote Energy Conservation that could help to increase energy efficiency and reduce air emissions from energy use.

Impacts on Petroleum Fuels

PROJECT-SPECIFIC IMPACTS: In general, implementation of the 2005 Ozone Strategy may result in a decrease in the demand for petroleum fuels (i.e., gasoline and diesel) due in part to the potential use of alternative fuels for buses, idling restrictions and all the mobile source and transportation control measures in the 2005 Ozone Strategy.

However, an increase in the use of add-on control equipment and devices, such as diesel particulate filters, SCRs, catalytic controls, etc., generally result in a slight decrease in engine fuel efficiency. While overall emissions are reduced with these technologies, there could be an increase in petroleum fuel usage.

Table 3.17-8 shows the Bay Area gasoline and diesel fuel consumption in 2000 and the projected consumption in 2005 and 2010. Long term forecast is for total vehicles, vehicle travel and fuel consumption to continue to increase but at declining rates. The fuel consumption for new cars is expected to remain at 27.5 miles per gallon, and the fleet economy will reach a peak value of 18.82 miles per gallon by year 2021 (Caltrans, 2003).

TABLE 3.17-8

Projected Fuel Consumption in the Bay Area*
(million gallons/year)

Fuel Type	2000	2005	2010
Gasoline	2,824	2,990	3,279
Diesel	386	346	381
Total	3,210	3,336	3,660

*Caltrans, 2003

The changes in the consumption of diesel fuels associated with the 2005 Ozone Strategy are expected to be included in the forecast in Table 3.17-8. The largest increase in diesel fuel demand would be expected to come from increased/expanded bus service and non-electrified rail service due to an increase in the number of riders. The Ozone Strategy may result in a minor increase in diesel fuel usage due to a decreased fuel efficiency associated with add-on control equipment. On the other hand, a decrease in diesel fuel use would be expected to occur associated with control measures that switched to alternative fuels (e.g., TCM 3 – Improve Local and Areawide Bus Service and TCM 5 – Improve Access to Rail and Ferries).

TCM 7 – Improve Ferry Service could result in a higher energy per passenger miles traveled value than other transit modes. This higher energy consumption ratio occurs as a result of the WTA meeting its design and purpose as an effective transportation alternative in terms of service and routes. The difference in energy consumption per passenger mile traveled between ferries and automobiles is greater for ferries but not significantly different (see Table 3.17-9). The difference between ferries and other modes is more substantial, and therefore this impact remains significant following mitigation (WTA, 2003).

TABLE 3.17-9

Comparison of Bay Area Passenger Data for Mass Transit Modes(1)

Transit Mode	Passengers/Run	Energy/PMT(2) (Btu/PMT)	Total PMT
Automobile	1.17	5,321	207,919,595
Buses	56	660	18,083,990
Light Rail	110	91	2,125,739
BART	1,056	68	33,151,135
Commuter Rail	971	102	8,263,795
Ferries	67	6,297	415,612

(1) WTA, 2003

(2) PMT = passenger miles traveled

Conclusion: Based upon the above considerations, TCM 7 – Improve Ferry Service could result in a higher energy per passenger miles traveled value than other transit modes so the impacts on petroleum fuels are potentially significant.

PROJECT-SPECIFIC MITIGATION: Significant impacts were identified for petroleum fuels associated with TCM 7 - Improve Ferry Service. The following mitigation measure has been imposed by the WTA:

UT1 The WTA is planning to continue investigating the feasibility and applicability of using energy sources other than fossil fuels and different engine technologies. One promising technology is the use of fuel cells. The WTA has investigated the use of alternative fuels for ferries in New Technologies and Alternative Fuels Working Document. Alternative energy sources and engine technologies will become available and will be incorporated as they become feasible and cost-effect.

The impact could be less than significant with implementation of the above mitigation measures. However, the effectiveness of the mitigation cannot be quantified at this time. Therefore, this impact remains potentially significant.

Impacts on Alternative Fuels

PROJECT-SPECIFIC IMPACTS: The 2005 Ozone Strategy may cause a shift from conventional petroleum fuel to alternative fuels. The increased use of alternative fuels in California's transportation energy market continues at a gradual pace, but could be limited by a variety of market and regulatory uncertainties. Continuing progress in reducing new gasoline vehicle emissions is having a negative effect on auto industry development and marketing of alternative fuel vehicles. The use of cleaner-burning alternative fuels such as CNG is not receiving as much emphasis in light-duty vehicle emission-reducing strategies as previously expected. The combination of gasoline reformulation and advances in automotive emission control technology appears to be making the exhaust emission levels required by California's low-emission vehicle standards achievable without relying on the use of alternative fuels. Therefore, the demand for alternative fuels would depend on their marketing strategies and the development of infrastructure to affect consumer choice.

There is growing interest and financial support for the use of hydrogen-powered fuel cells to power cars, trucks, homes and businesses. The federal government is supporting the development of hydrogen-powered fuel cells in order to reverse America's growing dependence on foreign oil. The federal government is providing funding for the development of technologies and infrastructure to produce, store, and distribute hydrogen for use in fuel cell vehicles and electricity generation. A total of about $1.7 billion over a five year period was provided to develop hydrogen-powered fuel cells, hydrogen infrastructure and advance automotive technologies.

Hydrogen fuel cells are proven technology but more work is needed to make them cost-effective for use in cars, trucks, homes or businesses. Hydrogen fuel cells create electricity to power cars with minimal pollution. While hydrogen fuel cell technology is promising, its use in the future is dependent on many things (cost-effectiveness of the technology, availability of hydrogen, etc.), so that the extent to which it may be used in the future is currently unknown.

Conclusion: Although the 2005 Ozone Strategy may result in an increase in alternative transportation fuels, this increase is not expected to be significant since alternative fuels (e.g., natural gas and hydrogen) are available or the feedstock that produces the fuels are generally available. Future demand could be met through increased production. The energy impacts associated with the future use of alternative fuels are expected to be less than the current strategy that uses predominately petroleum-based fuels so that no significant impacts on alternative fuels are expected.

PROJECT-SPECIFIC MITIGATION: No significant impacts on alternative fuels are expected so no mitigation measures are required.

3.17.3.2 Solid/Hazardous Waste Impacts

The analysis of solid/hazardous waste impacts assumes that safety and disposal procedures required by various agencies in the State of California will provide reasonable precautions against the improper disposal of hazardous wastes in a municipal waste landfill. Because of State and federal requirements, some facilities are attempting to reduce or minimize the generation of solid and hazardous waste by incorporating source reduction technologies to reduce the volume or toxicity of waste generated, including improving operating procedures, using less hazardous or non-hazardous substitute materials, and upgrading or replacing inefficient processes.

Potential Solid Waste Impacts due to Air Pollution Control Technologies

PROJECT-SPECIFIC IMPACT: Table 3.17-6 identifies those proposed control measures that may have potential project specific impacts on solid waste due to the addition of pollution control equipment that may need disposal and replacement. It is difficult to quantify the number of facilities that would employ these types of equipment, the rate of disposal necessary to maintain the equipment, type of waste generated by the equipment (i.e., hazardous or non-hazardous) and the timing by which these technologies would come into use.

Particulate matter collected on filters is expected to be small. Diesel particulate filters are estimated to collect about 10 to 150 grams of material per vehicle per year (CARB, 2002), and the particulate collected is considered hazardous waste. The amount of material collected from these types of control equipment is expected to be minor as described in the following paragraphs and could be handled within the capacity of existing disposal facilities.

The diesel PM10 filter system consists of a filter positioned in the exhaust stream designed to collect a significant fraction of the PM10 emissions while allowing the exhaust gases to pass through the system. Since the volume of PM10 generated by a diesel engine is sufficient to fill up and plug a reasonably sized filter over time, some means of disposing of this trapped PM10 must be provided. The most promising means of disposal is to burn or oxidize the PM10 in the filter, thus regenerating, or cleansing, the filter.

A complete filter system consists of the filter and the means to facilitate the regeneration, if not of the disposable type. The exhaust temperature of diesels is not always sufficient to initiate regeneration in the filter. A number of techniques are available to bring about regeneration of filters. It is not uncommon for some of these various techniques to be used in combination. Some of these methods include:

- Using a catalyst coated on the filter element. The application of a base or precious metal coating applied to the surface of the filter reduces the ignition temperature necessary for oxidation of the particulate;

- Using a NOx conversion catalyst upstream of the filter to facilitate oxidation of NO to NO_2 which adsorbs on the collected PM10, substantially reducing the temperature required to regenerate the filter;

- Using fuel-borne catalysts to reduce the temperature required for ignition of the accumulated material;

- Throttling the air intake to one or more of the cylinders, thereby increasing the exhaust temperature;

- Using fuel burners, electrical heaters, or combustion of atomized fuel by catalyst to heat the incoming exhaust gas to a temperature sufficient to ignite the PM10;

- Using periodically compressed air flowing in the opposite direction of the PM10 from the filter into a collection bag which is periodically discarded or burned; and

- Throttling the exhaust gas downstream of the filter. This method consists of a butterfly valve with a small orifice in it. The valve restricts the exhaust gas flow, adding back pressure to the engine, thereby causing the temperature of the exhaust gas to rise and initiating combustion.

Baghouses and HEPA filters collect particulate emissions from station sources. Prefilters and filters collect particulate emissions from mobile sources of particulate emissions. These types of filtration control equipment can effectively remove particulate matter, including heavy metals, asbestos, as well as other toxic and nontoxic compounds.

Polytetrafluoroethylene (PTFE) membranes or HEPA filters can increase a system's removal efficiency up to 99.9 percent. In general, as particulate size decreases, the

surface area to volume ratio increases, thus increasing the capacity of these filters to adsorb smaller particles (including hazardous materials). An increase in the use of membranes and filters may increase solid waste requiring disposal in landfills in amounts greater than what would be produced if the 2005 Ozone Strategy were not adopted. In some cases, the waste generated will be hazardous (e.g., the collection of toxic emissions). The increase in the amount of waste generated from the use of filters and the collection of additional particulate matter are expected to be small as the amount of material collected is small. Therefore, the potential impacts of the use of additional filtration equipment on solid/hazardous waste generation are less than significant.

Based on the above considerations no significant adverse solid/hazardous waste impacts are anticipated to occur from the use of particulate traps.

State law requires hazardous waste generators to attempt to recycle their wastes in lieu of disposal. OEHHA has implemented a hazardous waste exchange program to promote the use reuse and exchange of hazardous wastes. The program is designed to assist generators of hazardous wastes to recycle their wastes and encourage the reuse of the wastes. The DTSC also publishes a directory catalog of industrial waste recyclers annually so that industries will know where to buy, sell, or exchange their wastes.

Conclusion: Based upon the above considerations, significant adverse impacts to solid and hazardous waste are not expected due to implementation of the control measures within the 2005 Ozone Strategy.

PROJECT-SPECIFIC MITIGATION: No significant solid/hazardous waste impacts were identified for solid waste impacts due to air pollution control technologies as part of the 2005 Ozone Strategy so no mitigation measures are required.

Carbon Adsorption

The proposed control measures may generate additional solid or hazardous waste in the form of carbon used to control organic emissions, should facilities choose to comply using activated carbon filters. The additional volume of carbon is not expected to be significant since carbon is usually collected and regenerated so that little additional solid waste would be expected.

PROJECT-SPECIFIC IMPACT: Several control measures could encourage the use of carbon adsorption as air pollution control equipment including SS 3 – High Emtting Spray Booths, SS 8 – Marine Loading Operations, and SS 10 – Pressure Relief Devices. The amount of solid waste, which may be generated by the carbon adsorption process would depend on the number of carbon adsorbers installed, the operating characteristics, and the frequency of carbon replacement. Most of the control measures have alternative methods of compliance, e.g., reformulation of materials, so that all facilities would not be expected to use carbon adsorption to comply.

If carbon adsorption systems are used, the amount of hazardous waste generated on an annual basis is expected to be minimal. Most activated carbon used in carbon adsorption control devices is reclaimed and reactivated, resulting in negligible impacts on solid waste disposal facilities. Activated carbon can have a lifetime of five to 10 years; however, the operating characteristics of the control device may result in a shorter lifetime.

Spent carbon is usually recycled and reused rather than disposed in landfills. Most facilities contract out with vendors that take the spent carbon and deliver regenerated carbon. Another alternative to the land disposal of regenerated carbon is to burn the spent carbon in a thermal incinerator. With thermal incineration, the organic materials contained in the carbon are oxidized to carbon dioxide, water, and in most cases, harmless combustion by-products. Incineration destroys the toxic constituents and significantly reduces the volume of carbon to be disposed of, thus reducing solid waste impacts. The disadvantage of incineration is that without additional add-on control devices, there may be an increase in criteria pollutant emissions. Further, it is not expected that carbon adsorption will be used in every case where it is listed as a control option. It is expected that facilities will continue to choose other more cost-effective options to comply with control measures.

Conclusion: Based upon the above considerations, significant adverse solid waste impacts resulting from the use of carbon adsorption are not expected due to implementation of the control measures within the 2005 Ozone Strategy.

PROJECT-SPECIFIC MITIGATION: No significant impacts due to the use of carbon adsorption are expected so no mitigation measures are required. However, it is recommended that recycling and reusing activated carbon should be required to minimize the amount of spent carbon waste being transferred to landfills.

Early Retirement of Equipment

PROJECT-SPECIFIC IMPACT: Control Measure MS 3 – Low Emission Vehicle Incentives and MS 4 – Vehicle Buy Back Program may result in the early retirement (scrapping) of vehicles.

Approximately 80 percent of a retired vehicle can be recycled and reused in another capacity. Batteries, catalytic converters, tires, and other recoverable materials (e.g., metal components) are removed and the rest of the vehicle is shredded. The shredded material is then sent for recovery of metal content. Therefore, the amount of solid waste landfilled as a result of the proposed measures would be smaller than the size of the vehicle. Additionally, there are a limited number of vehicles that can be scrapped per year. These vehicles would be scrapped in the near future, regardless of the control measures as they are older vehicles. Further, these control measures are not expected to mandate that older vehicle, engines, or other equipment be scrapped. The control measures are expected to allow a number of different control methods to comply with the required emission reductions. Control measures that would require new equipment will generally require

that it occur at the end of the life of the old equipment and new equipment is put into service. Control Measures MS 3 – Low Emission Vehicle Incentives and MS 4 – Vehicle Buy Back Program are expected to result in earlier retirement of vehicles than would have occurred without these control measures. Therefore, the control measures would not necessarily result in an increase in the generation of waste, rather they would result in an earlier generation of the waste. Based on the above, the increase in solid waste is expected to be accounted for within the California Integrated Waste Management Board's permitted capacity of the landfills within the Bay Area of over 52,715 tons per day so that no significant impacts would be expected.

The California Integrated Waste Management Act of 1989 (AB 939) requires cities and counties in California to reduce the amount of solid waste disposed in landfills by 25 percent by 1995 and by 50 percent by 2000, through source reduction, recycling and composting activities. Many cities and counties have not met these waste reduction goals. The generation of additional waste could impact the abilities of cities and counties to further reduce wastes. However, as discussed above the increase in solid waste that is expected to be diverted to a landfill is small and many of the waste streams are recyclable.

Conclusion: Based upon the above considerations, significant adverse impacts on landfill capacity are not expected due to implementation of the control measures within the 2005 Ozone Strategy.

PROJECT-SPECIFIC MITIGATION: No significant impacts on solid/hazardous waste associated with the early retirement of vehicles were identified so no mitigation measures are required.

Reject Low VOC Content Coatings

PROJECT-SPECIFIC IMPACT: PROJECT-SPECIFIC IMPACTS: Several of the control measures in the 2005 Ozone Strategy would include controlling VOC emissions through the reformulation of coatings including SS 1 – Auto Refinishing; SS 2 – Graphic Arts Operation; SS 3 – High Emitting Spray Booths; SS 4 – Polyester Resin Operations; and SS 5 – Wood Products Coating. Emission reductions are expected to be achieved through the use of near-zero and zero VOC formulations. There is the potential for compliant lower VOC coatings:

- to not have the same freeze-thaw capabilities as existing coatings;
- to have shorter shelf lives and "go bad" sooner than conventional coatings; and
- to result in a shorter pot life compared to conventional coatings.

The above conditions could result in an increased generation of materials that would require disposal. CARB evaluated the potential impact of these conditions to increase the generation of waste (CARB, 2000) and their evaluation is summarized below.

CARB evaluated the coating product data sheets and determined that all categories of low-VOC coatings except quick dry primers, sealers, and undercoaters have comparable or even longer shelf lives than conventional coatings. However, low VOC industrial maintenance and floor coatings had average pot lives that were shorter (one the order of about one-half) than those of conventional coatings. The NTS Study showed that there are compliant water-borne coatings that pass freeze-thaw stability tests. Furthermore, manufacturers have indicated that the addition of surfactants will help to overcome freeze-thaw problems.

CARB assumed that about five percent of all affected coatings that currently do not comply with the lower VOC limits would be landfilled due to freeze-thaw problems, one percent of all affected coatings would be landfilled due to a shorter shelf life, and 10 percent of all industrial maintenance and floor coatings would be landfilled as a result of a shorter pot life (CARB, 2000). According to California law, coatings that have solidified are not considered hazardous waste and may be disposed of in municipal landfills. Liquid coatings must be sent to a hazardous waste treatment facility. Therefore, the only coatings that would solidify and be considered non-hazardous waste would be industrial maintenance and floor coatings. The empty containers of failed (but still liquid) coatings due to freeze-thaw and shelf-life problems were included in the solid waste analysis. Table 3.17-10 shows the estimated non-hazardous material that may be landfilled in the counties that make up the BAAQMD's jurisdiction. Table 3.17-10 shows that landfilling of non-hazardous material will account for less than one percent of the permitted throughput capacity of any county and is considered less than significant.

TABLE 3.17-10

Projected Solid Waste Impacts Associated with Low VOC Coatings in the Bay Area

County	Permitted Throughput tons/day[(1)]	Freeze-Thaw Disposal tons/day (2010)[(2)]	Shelf-life Disposal tons/day (2010)[(2)]	Pot Life Disposal tons/day (2010)[(2)]	Total Disposal tons/day (2010)[(2)]	Total Impact (% of Permitted Throughput)
Alameda	16,014[(3)]	0.196	0.033	0.384	0.613	0.004
Contra Costa	7,500	0.082	0.014	0.162	0.258	0.003
Marin	2,375	0.021	0.004	0.041	0.065	0.003
Napa	300	0.012	0.002	0.023	0.036	0.012
San Francisco	0	0.063	0.011	0.123	0.197	N/A
San Mateo	3,998	0.065	0.011	0.129	0.205	0.005
Santa Clara	13,100	0.162	0.027	0.319	0.508	0.004
Solano	6,730	0.038	0.006	0.076	0.120	0.002
Sonoma	2,500	0.044	0.007	0.086	0.137	0.005
TOTAL	52,517	0.683	0.115	1.343	2.139	

(1) See Appendix C for additional information.
(2) Source: CARB, 2000.

(3) Includes wastes from the city and county of San Francisco as about 90 percent of waste generated in San Francisco is disposed of in the Altamont Landfill in Alameda County (County of San Francisco, 2004).

To estimate the amount of liquid hazardous waste that would be generated due to implementation of low VOC content coatings, it was assumed that five percent and one percent per year of all coatings would be disposed due to freeze-thaw and shelf-life problems, respectively. In order to provide a conservative estimate of waste generation, it was also assumed that all coatings, including existing solvent-borne formulations, would be reformulated as waterborne coatings. The amount of hazardous waste generated in the Bay Area was estimated by assuming that the amount of hazardous waste generated within the Air District was the same percentage of solid waste as compared to the state total. (About 21.1 percent of the projected amount of solid wastes generated from low VOC coatings in the state are estimated to be generated in the Bay Area.). As shown in Table 3.17-11, the increased amount of coatings that would be disposed of in hazardous waste landfills is not expected to be significant. Further, there are financial incentives to the manufacturer to reduce the amount of reject coatings generated and, therefore, the amount disposed, since it costs to manufacture the coating and then to dispose of the material if it is rejected. Therefore, as these coatings become more common and there is more experience with their manufacture and use, fewer coatings are expected to be disposed.

TABLE 3.17-11

Projected Hazardous Waste Impacts Associated with Low VOC Coatings in the Bay Area (1)

Facility	Remaining Capacity (cubic yards)	Estimated Remaining Years	Freeze-Thaw Disposal (cubic yards)	Shelf-Life Disposal (cubic yards)	Total Disposal (cubic yards)	Total Impact (% of Remaining Capacity)
Chem Waste Management, Kettleman Hills	9 million	15	16,214	3,261	19,475	0.216
Safety Kleen	9 million	40	259	36	295	0.003

(1) Source: CARB, 2000

Conclusion: Based upon the above considerations, significant adverse impacts on hazardous waste disposal facilities are not expected due to implementation of the control measures within the 2005 Ozone Strategy.

PROJECT-SPECIFIC MITIGATION: No significant impacts on hazardous waste disposal facilities due to additional reject low VOC content coatings are expected so no mitigation measures are required.

Water Demand Impacts

PROJECT-SPECIFIC IMPACT: Increased water consumption may occur due to the reformulation of coatings to aqueous-based materials. Several of the control measures in the 2005 Ozone Strategy would propose to control VOC emissions through the reformulation of coatings and products including SS 1 – Auto Refinishing; SS 2 – Graphic Arts Operation; SS 3 – High Emitting Spray Booths; SS 4 – Polyester Resin Operations; and SS 5 – Wood Products Coating. No other control measures were identified that were expected to result in an increase in water use.

CARB estimated the amount of water use associated with its proposed architectural coatings suggested control measure (CARB, 2000). The primary objective of the CARB's control measure was to set VOC limits and other requirements that are feasible (based on current technology) and that will achieve significant emission reductions in VOC emissions from architectural coatings. CARB estimated that the projected water demand from the implementation of the low-VOC coating rules in the Bay Area would be about 6.28 million gallons per year by 2010 or about 17,206 gallons per day (CARB, 2000). CARB's estimate for water demand is expected to be conservative because many of the sources that would use reformulated coatings/solvents have already reformulated some of the coatings/solvents, and the estimate assumes that the only method for compliance would be reformulation This potential water demand is within the capacity of water supplied from various sources in the Bay Area (estimated water demand of about 1,880 billion gallons per year in 2010) (CARB, 2000) and is not considered significant compared with current and projected future demand and supply. While there are projected drought-year shortages in some regions of California, these shortages would occur regardless of the proposed control measures.

Conclusion: Based upon the above considerations, no significant adverse impacts on water demand are expected due to implementation of the control measures within the 2005 Ozone Strategy.

PROJECT-SPECIFIC MITIGATION: No significant water demand impacts were identified as part of the proposed project so no mitigation measures are required.

3.17.4 MITIGATION MEASURES

The mitigation measures for resources were addressed in each subcategory. Energy impacts remain potentially significant following mitigation.

3.17.5 CUMULATIVE UTILITIES AND SERVICE SYSTEM IMPACTS

Cumulative Energy Impacts

The analysis of adverse cumulative impacts to energy resources is different than the comparable analysis for other impacts areas for several reasons. First, it is difficult to quantify past energy impacts relative to implementation of the past air quality plans

because it is difficult to determine an actual link between past business practices (and associated energy demand) and compliance with air quality rules and regulations. There is no methodology to estimate past energy demand relative to past air plans. A second difficulty inherent in evaluating cumulative energy resources impacts is that it is difficult to predict if an affected facility will alter its energy demand in the future or switch to a different resource as a result of complying with a control measure included in the Ozone Strategy because of other business considerations. For example, an affected facility owner might switch to an alternative clean fuel if equipment using that alternative clean fuel is much more efficient than the old equipment using conventional fuels. This decision could have been made for a variety of reasons such as cost savings, increased production capacity, etc., and may not be related to the 2005 Ozone Strategy. Currently, analyses do not make these distinctions.

The energy impacts associated with implementation of the 2005 Ozone Strategy are analyzed relative to future baseline energy projections. The future baselines are based upon existing baselines, which is essentially past energy resource utilization plus future energy resource utilization. The estimated future energy resource demand from the 2005 Ozone Strategy is present energy demand plus future anticipated demand. Therefore, the project-specific energy resource impacts evaluated in preceding sections are equivalent to a cumulative impact analysis. The overall impact of the 2005 Ozone Strategy is to more effectively use buses, ferries, and rail transportation as opposed to single occupancy vehicles. The use of buses and rail (including light rail, BART, and commuter rail) result in a lower energy consumption than automobiles or ferries (see Table 3.17-9). It is predicted that buses, light rail, BART, and commercial rail, will transport millions more passengers than ferries (see Table 3.17-9). Therefore, the overall cumulative impact of the 2005 Ozone Strategy on energy, is expected to be less than significant.

CUMULATIVE ENERGY IMPACT MITIGATION: No significant adverse cumulative energy impacts were identified so no mitigation measures are required.

Cumulative Solid/Hazardous Waste Impacts

The proposed 2005 Ozone Strategy is not expected to result in significant, cumulative adverse impacts on solid or hazardous waste. Significant impacts were not identified for an increase in waste from the 2005 Ozone Strategy. The control measures are expected to allow a number of different control methods to comply with required emission reductions. The most cost effective control measures would be expected to be implemented. Control measures that would require new equipment will generally require that it occur as the life of the old equipment is exhausted and new equipment is put into service. Further, recycling of vehicles for scrap metal is common and expected to continue. Therefore, the increase in solid waste is expected to be within the permit capacity so that no significant cumulative impacts would be expected.

CUMULATIVE SOLID/HAZARDOUS WASTE MITIGATION: No significant cumulative solid/hazardous waste impacts were identified so no mitigation measures are proposed.

CHAPTER 4

ALTERNATIVES

4.0 ALTERNATIVES

4.1 INTRODUCTION

According to the CEQA guidelines, alternatives should include realistic measures to attain the basic objectives of the proposed project and provide means for evaluating the comparative merits of each alternative (CEQA, Guidelines, § 15126.6(a)). In addition, though the range of alternatives must be sufficient to permit a reasoned choice, they need not include every conceivable project alternative (CEQA Guidelines §15126.6(a)). The discussion of alternatives must focus on alternatives to the project or its location which are capable of avoiding or substantially lessening any significant effects of the proposed project, even if these alternatives would impede to some degree the attainment of the project objectives, or would be more costly (CEQA Guidelines §15126.6(a)). The key issue is whether the selection and discussion of alternatives fosters informed decision making and public participation. An EIR need not consider an alternative whose effect cannot be reasonably ascertained and whose implementation is remote and speculative (CEQA Guidelines, § 15126.6(f)(3)).

The alternatives typically included in CEQA documents are developed by breaking down the project into distinct components (i.e., implementation dates, funding levels, policy emphases, etc.) and varying the specifics of one or more of the components. Different compliance approaches that generally achieve the objectives of the project may also be considered as project alternatives.

The possible alternatives to the proposed 2005 Ozone Strategy are limited by the nature of the project. The CCAA requires the BAAQMD to reduce pollutants contributing to non-attainment to the maximum extent feasible. As such, the proposed 2005 Ozone Strategy, and any acceptable project alternatives, must comply with this criterion to attain the basic objectives of the project. Consequently, all viable project alternatives must include at a minimum all the control measures identified in the 2005 Ozone Strategy.

4.2 ALTERNATIVES REJECTED AS INFEASIBLE

In accordance with CEQA Guidelines §15126.6(c), a CEQA document should identify any alternatives that were considered by the lead agency, but were rejected as infeasible during the scoping process and briefly explain the reason underlying the lead agency's determination. Section 15126.6(c) also states that among the factors that may be used to eliminate alternatives from detailed consideration in an EIR are: (1) failure to meet most of the basic project objectives; (2) infeasibility; or (3) inability to avoid significant environmental impacts.

Under a typical alternatives analysis, the control measures with potentially significant adverse impacts, following mitigation, would be removed from the 2005 Ozone Strategy. The control measures that would be eliminated under this alternative include SS 14 Stationary Gas Turbines, TCM 1 – Voluntary Employer-Based Trip Reduction Programs,

TCM 3 – Improve Local and Areawide Bus Service, TCM 4 – Upgrade and Expand Local and Regional Rail Service, TCM 6 – Improve Interregional Rail Service, TCM 7 – Improve Ferry Service, TCM 8 – Contruct Carpool/Express Bus Lanes on Freeways, TCM 11 – Install Freeway Traffic Management Systems, TCM 13 - Transit Use Incentives, and TCM 15 Local Land use Planning and Development Strategies. However, this alternative is not legally feasible for several reasons. First, some of these control measures have already been approved as part of the 2000 CAP and would still be implemented even if they were removed from the 2005 Ozone Strategy.

Second, the BAAQMD is required under the CCAA to adopt all feasible measures. To satisfy the all feasible measures requirement, the Air District investigated a wide range of potential ideas from many sources. The steps the BAAQMD took to identify all feasible control measures are outlined in Chapter 2, Sections 2.3, 2.3.1, 2.3.3, 2.3.5, and 2.3.6. In total, Air District staff considered 390 control measure suggestions primarily from stationary and mobile sources. Of the 390 control measure suggestions considered by Air District staff the potential control measures were distilled down to the measures identified in the 2005 Ozone Strategy that were determined to be feasible per the requirements of California Health and Safety Code §40922(b). The factors taken into consideration when determining which control measures are feasible include cost effectiveness, technological feasibility, total emission reduction potential, the rate of reduction, public acceptability, and enforcement (CCR §40922 (a-b)). MTC took the lead in evaluating transportation control measures, and conducted a TCM Workshop in September 2003 to solicit TCM ideas from the public. MTC and Air District staff worked together in revising the TCMs and their TCM evaluation process was summarized in their evaluation report, "Evaluation of Transportation Control Measures for Federal and State Air Quality Plans" (October 2003).

Third, the Air District is required under the California Health and Safety Code to include all feasible control measures, including §70600(b)(1), which requires the adoption and implementation of BARCT on all existing stationary sources of ozone precursor emissions as expeditiously as practicable. In addition, the BAAQMD must include measures to attain the State ambient air quality standard for ozone by the earliest practicable date §70600(b)(2) in order to help other adjacent air basins where ozone generated in the Bay Area is transported. Some of CARB's transport mitigation requirements are included among CCAA planning requirements for all non-attainment areas. To summarize the transport mitigation requirements, the Air District must:

1. Adopt and implement all feasible measures.
2. Adopt and implement BARCT.
3. Adopt a no net increase permitting program for sources above 10 tons per year.
4. Include measures to attain the standard in specified downwind regions.

The requirements to adopt all feasible measures and implement BARCT on all existing stationary sources are necessary for the Bay Area to meet both the CCAA and transport mitigation requirements, and are addressed in the control strategy as well as through Air District rule development and permitting processes. With respect to the no net increase

requirement, the Air District adopted a 10 ton/year no net increase requirement for ozone precursors in District Regulation 2, Rule 2: New Source Review on December 21, 2004. Regarding measures sufficient to attain the State ozone standard in specified transport areas, this is accomplished by the requirement to adopt all feasible measures. As adoption of all feasible measures represents the most stringent control strategy that can be accomplished, this requirement is met with the approval of each triennial plan.

Therefore, per the CCAA, once feasible control measures have been identified, they are required to be included in the Ozone Strategy. Based on this requirement, alternatives that did not include all feasible measures were considered infeasible and were not considered.

4.3 ALTERNATIVES TO THE 2005 OZONE STRATEGY

The number of potential alternatives to the BAAQMD's 2005 Ozone Strategy is limited because of the aforementioned requirement in the CCAA that emissions must be reduced to the maximum extent feasible. Two alternatives to the proposed Ozone Strategy were identified in this EIR: 1) the No Project Alternative, which is required under CEQA regulations: and 2) the Transit Access and Low Emission Vehicle Emphasis Alternative. Both of these alternatives are evaluated in this section.

4.3.1 ALTERNATIVE 1 – NO PROJECT ALTERNATIVE

CEQA requires a No Project Alternative to be evaluated. A No Project Alternative consists of what would occur if the project were not approved. In this case, the No Project Alternative refers to the BAAQMD taking no further action to meet its one-hour State ozone standard requirements under the CCAA with the exception of continuing to adopt rules and regulations contained in the 2000 Clean Air Plan (CAP). Adopting the No Project Alternative does not imply that no further action will be taken to implement control measures that reduce emissions that contribute to ozone. In this case, the net effect of not adopting the 2005 Ozone Strategy would be a continuation of the existing 2000 CAP. The environmental impacts of the 2000 CAP were evaluated in a separate CEQA document (BAAQMD, 2000). The No Project Alternative analyzed herein will take into account the most current air quality setting and will include control measures as contained in the 2000 CAP, but no new control measures.

Under the No Project Alternative, the Air District will continue to implement the control measures identified in Table 4.3-1. This approach is consistent with CEQA Guidelines §15126.6(e)(3)(A), which states "When the project is the revision of an existing land use or regulatory plan, policy or ongoing operation, the 'no project' alternative will be the continuation of the existing plan, policy, or operation into the future. Typically this is a situation where other projects initiated under the existing plan will continue while the new plan is developed. Thus, the projected impacts of the proposed plan or alternative plans would be compared to the impacts that would occur under the existing plan."

TABLE 4.3-1

2000 CAP Control Measures

Control Measure No.	Description of Control Measure
Stationary Sources	
A1	Improved Architectural Coatings Regulation 8, Rule 3
A5	Surface Preparation and Cleanup Standards for Metal Parts Coating, Regulation 8, Rule 14
A21	Improved Automobile Refinish Coatings (Reg. 8, Rule 45)
A22	Improved Wood Products Coatings Regulation 8, Rule 32
A23	VOC Limits for Concrete Coating Operation Reg 8 Rule 4
B2	Improved Storage of Organic Liquids Regulation 8, Rule 5
C4	Improved Process Vessel Depressurization Reg 8, Rule 10
D8	Improved Residential Water Heater Regulation 9, Rule 6
G3	Seasonal Limitations on Organic Liquid Storage Tank and Wastewater Separator Cleaning and Refinery Shutdowns
A3	Improved Aerospace Coatings, Regulation 8, Rule 29
A6	Improved Surface Coating of Plastic Parts and Products Regulation 8, Rule 31
C7	Control of Emissions from Petroleum Refinery Flares (Regulation 12, Rule 11)
C8	Draining of Liquid Products/Sumps and Pits
F7	Easing of Administrative Requirements for Use of Lower Emitting Technology
F8	Limitations on Solvents Based on Relative Reactivities
Transportation Control Measures	
TCM 1	Support Voluntary Employer-Based Trip Reduction Programs
TCM 3	Improve Areawide Transit Service
TCM 4	Improve Regional Rail Service
TCM 5	Improve Access to Rail and Ferries
TCM 6	Improve Intercity Rail Service
TCM 7	Improve Ferry Service
TCM 8	Construct Carpool/Express Bus Lanes on Freeways
TCM 9	Improve Bicycle Access and Facilities
TCM 10	Youth Transportation
TCM 11	Install Freeway/Arterial Metro Traffic Operations Systems
TCM 12	Improve Arterial Traffic Management
TCM 13	Transit Use Incentives
TCM 14	Improve Rideshare/Vanpool Services and Incentives
TCM 15	Local Clean Air Plans, Policies and Programs
TCM 16	Intermittent Control Measure/Public Education
TCM 17	Construct Demonstration Projects
TCM 18	Transportation Pricing Reform
TCM 19	Pedestrian Travel
TCM 20	Traffic Calming

Failure to implement additional control measures may also violate State of California requirements that areas designated non-attainment for State standards should demonstrate continued reductions in emissions. There would be no further improvements in air quality if no emissions controls beyond those currently required were implemented. The projected baseline air quality would represent a no further action scenario. Further, the BAAQMD may not attain the State ambient air quality standards as required by the CCAA if the 2005 Ozone Strategy is not implemented.

Under the No Project Alternative, additional emission reductions would accrue from vehicle fleet turnover and on-going implementation of State (CARB) and federal control measures. However, the emission reductions are not expected to be enough to show progress towards attainment of the State one-hour ozone standard.

4.3.2 ALTERNATIVE 2 –TRANSIT ACCESS AND LOW EMISSION VEHICLE EMPHASIS ALTERNATIVE

Significant impacts were identified for some transportation control measures related to access to transit stations, including TCM 4 – Upgrade and Expand Local and Regional Rail Service, TCM 6 – Improve Interregional Rail Service, and TCM 7 – Improve Ferry Service. The impacts from accessing transit stations include air quality and transportation impacts. The localized air quality impacts would result from CO emissions from cold starts during congested rush hours and diesel exhaust from idling buses accessing the transit facilities. While localized CO impacts are unlikely due to statewide use of oxygenated fuels and declining trends in background CO concentrations, the level of analysis provided in this Program DEIR prevented the District from concluding the impact would be less than significant. Transportation impacts would occur from congestion during rush hours in the vicinity of the transit facilities. All of these impacts could be compounded in some locations by TCM 15 – Local Land Use Planning and Development Strategies, that would encourage higher densities around transit facilities resulting in increased generation and exposure to air pollutants and increased traffic congestion.

Under Alternative 2, a greater emphasis would be placed on implementing control measures in the 2005 Ozone Strategy that in part mitigate the air quality and transportation and traffic impacts identified with some of the TCMs, particularly those control measures that improve access to transit facilities and encourage increased use of low emission vehicles. TCM 3 – Improve Local and Areawide Bus Service, would reduce exposure to diesel exhaust by replacing diesel buses with clean fuel buses and retrofit of existing buses with emission control devices. TCM 5 – Improve Access to Rail and Ferries would improve access to rail and ferries by expanding feeder buses and shuttles and improving bicycle and pedestrian access. TCM 9 – Improve Bicycle Access and Facilities would increase bicycle access to transit. TCM 15 – Local Land Use Planning and Development Strategies includes parking strategies that would reduce this impact, such as reduced parking, shared parking and parking pricing. TCM 19 - Improve Pedestrian Access and Facilities, would increase pedestrian access to transit facilities.

Measure MS 1- Diesel Equipment Idling Ordinance, would reduce bus emissions by limiting bus idling times. MS 3 – Low Emission Vehicle Incentives would reduce diesel exhaust and other mobile source emissions by increasing the number of low emission buses, as well as other light and heavy-duty vehicles.

4.4 ALTERNATIVES ANALYSIS

4.4.1 MINOR IMPACTS

The environmental analyses completed in Chapter 3 concluded that the potential impacts of the control measures included as part of the 2005 Ozone Strategy on some of the environmental resources were very minor on agricultural resources, mineral resources, population/housing, public services, and recreation. The alternatives evaluated in this DEIR could involve implementation of either the same number (no project alternative) or fewer control measures. Therefore, the potential impact of Alternatives 1 and 2 on agricultural resources, mineral resources, population/housing, public services, and recreation are expected to be the same as the proposed project, or less than significant. The potential impacts of the alternatives on the remainder of the environmental resources are addressed in this section.

4.4.2 AESTHETICS

Under the proposed project, there is the potential for significant aesthetic impacts associated with several TCMs, including TCM 4 – Improve Regional Rail Service, TCM 6 – Improve Intercity Rail Service, TCM 7 – Improve Ferry Service, and TCM 8 – Construct Carpool/Express Bus Lanes on Freeways. Construction of these TCMs could have significant impacts on views of the Bay, or the visual character of waterfront areas, or scenic highways.

4.4.2.1 Alternative 1 - No Project Alternative

Under the No Project Alternative, aspects of TCM 4 – Improve Regional Rail Service, TCM 6 – Improve Intercity Rail Service, TCM 7 – Improve Ferry Service, and TCM 8 – Construct Carpool/Express Bus Lanes on Freeways that were approved as part of the 2000 CAP would still be implemented, and the impacts resulting from the implementation of the Water Transit Authority's adopted Implementation and Operations Plan would still remain. Therefore, the potential significant impacts on aesthetics under the No Project Alternative remain the same as the proposed project.

4.4.2.1 Alternative 2 - Transit Access and Low Emission Vehicle Emphasis Alternative

Under the Improved Transit Access Alternative, the TCMs that could generate potentially significant aesthetic impacts would still be implemented. It is expected that similar structures, terminals, roadways and railways would be required under this alternative.

However, it is possible that fewer or smaller parking structures could be required near terminals and ferry buildings in order to encourage forms of transportation other than cars, or that parking fees could be sufficiently high enough to discourage driving to, and parking at, these facilities. Nonetheless, the potential significant impacts on aesthetics identified under the Alternative 2 are expected to remain about the same as the proposed project.

4.4.3 AIR QUALITY

The potential increase in congestion near train stations, ferry buildings and bus stations could result in potentially significant air quality impacts associated with certain TCMs, including TCM 1 – Voluntary Employer-Based Trip Reduction Programs, TCM 3 – Improve Local and Areawide Bus Service, TCM 4 – Improve Regional Rail Service, TCM 6 – Improve Intercity Rail Service, TCM 7 – Improve Ferry Service, TCM 11 – Install Freeway Traffic Management Systems, TCM 13 – Transit Use Incentives, and TCM 15 – Local and Land Use Planning and Development Strategies. In addition, cold-start emissions during the evening commute could lead to a violation of the short-term carbon monoxide standard which was also considered a potentially significant impact for the proposed project.

4.4.3.1 Alternative 1 - No Project Alternative

Under the No Project Alternative, aspects of TCM 1 – Voluntary Employer-Based Trip Reduction Programs, TCM 3 – Improve Local and Areawide Bus Service, TCM 4 – Improve Regional Rail Service, TCM 6 – Improve Intercity Rail Service, TCM 7 – Improve Ferry Service, TCM 11 – Install Freeway Traffic Management Systems, TCM 13 – Transit Use Incentives, and TCM 15 – Local and Land Use Planning and Development Strategies that were approved as part of the 2000 CAP would still be implemented, and the impacts resulting from the implementation of the Water Transit Authority's adopted Implementation and Operations Plan would still remain. Therefore, the potential significant impacts on air quality under the No Project Alternative remain the same as the proposed project.

4.4.3.2 Alternative 2 – Transit Access and Low Emission Vehicle Emphasis Alternative

Under the Transit Access and Low Emission Vehicle Emphasis Alternative, the TCMs that could generate potentially significant air quality impacts would still be implemented. However, more emphasis would be placed on other control measures, including TCM 3 – Improve Local and Areawide Bus Service, TCM 5 – Improve Access to Rail and Ferries, TCM 9 – Improve Bicycle Access and Facilities, TCM 19 - Improve Pedestrian Access and Facilities, MS 1 – Diesel Equipment Idling Ordinance and MS 3 – Low Emission Vehicle Incentives. It is expected that with more emphasis, early implementation, increased parking fees or other actions to help ensure the effectiveness of TCMs 3, 5, 9, 19, and MS-1 & 2, that the potential for significant air quality impacts would be reduced

when compared to the impacts anticipated from the proposed project. However, the extent to which this alternative would actually relieve the congestion expected around transit facilities and subsequently reduce CO emissions is unknown. Therefore, the potentially significant air quality impacts under the Transit Access and Low Emission Vehicle Emphasis Alternative remain the same as the proposed project.

4.4.4 BIOLOGICAL RESOURCES

The potential for significant biological impacts associated with the proposed project is largely associated with the implementation of TCM 7 – Improve Ferry Service. It was determined that the construction of new ferry buildings could have significant impacts on wetlands and marsh lands. The possibility of a ferry striking a whale was considered significant (although rare). Noise impacts on wildlife during construction activities were also considered significant.

4.4.4.1 Alternative 1 - No Project Alternative

Under the No Project Alternative, aspects of TCM 7 – Improve Ferry Service that were approved as part of the 2000 CAP would still be implemented, and the impacts resulting from the construction of new ferry facilities as approved by the Water Transit Authority in their adopted Implementation and Operations Plan would still remain. Therefore, the potential significant impacts on biological resources under the No Project Alternative remain the same as the proposed project.

4.4.4.2 Alternative 2 - Transit Access and Low Emission Vehicle Emphasis Alternative

Under the Transit Access and Low Emission Vehicle Emphasis Alternative, TCM 7 – Improve Ferry Service would still be implemented. Alternative 2 would provide increased emphasis on some TCMs including TCM 3 – Improve Local and Areawide Bus Service, TCM 5 – Improve Access to Rail and Ferries, TCM 9 – Improve Bicycle Access and Facilities, TCM 19 - Improve Pedestrian Access and Facilities, and MS-1 – Diesel Equipment Idling Ordinance. The increased emphasis on these TCMs will not alter the potentially significant impacts on biological resources associated with TCM 7 – Improve Ferry Service. Therefore, the potential significant impacts on biological resources under the Transit Access and Low Emission Vehicle Emphasis Alternative remain the same as the proposed project.

4.4.5 CULTURAL RESOURCES

The potential for significant cultural resources impacts associated with the proposed project is associated with the implementation of TCM 7 – Improve Ferry Service. TCM 7 would require dredging of new channels, or for pier retrofit or installation, that could impact submerged, sub-bottom and previously unknown cultural resources in San Francisco Bay near the Hercules/Rodeo terminal location. These impacts were considered to be potentially significant following mitigation.

4.4.5.1 Alternative 1 - No Project Alternative

Under the No Project Alternative, aspects of TCM 7 – Improve Ferry Service that were approved as part of the 2000 CAP would still be implemented, and the impacts resulting from the construction of new ferry facilities as approved by the Water Transit Authority in their adopted Implementation and Operations Plan would still remain. Therefore, the potential impacts on cultural resources under the No Project Alternative remain the same as the proposed project.

4.4.5.2 Alternative 2 - Transit Access and Low Emission Vehicle Emphasis Alternative

Under the Transit Access and Low Emission Vehicle Alternative, TCM 7 – Improve Ferry Service would still be implemented. Alternative 2 would provide increased emphasis on some TCMs including TCM 3 – Improve Local and Areawide Bus Service, TCM 5 – Improve Access to Rail and Ferries, TCM 9 – Improve Bicycle Access and Facilities, TCM 19 - Improve Pedestrian Access and Facilities, and MS-1 – Diesel Equipment Idling Ordinance. The increased emphasis on these TCMs will not alter the impacts on cultural resources associated with TCM 7 – Improve Ferry Service. Therefore, the potential impacts on cultural resources under the Transit Access and Low Emission Vehicle Emphasis Alternative remain the same as the proposed project.

4.4.6 GEOLOGY AND SOILS

The proposed project impacts on geology and soils were determined to be less than significant. Compliance with the Uniform Building Code requirements is expected to minimize the potential impacts associated with geological hazards. The issuance of building permits from the local cities or counties will assure compliance with the Uniform Building Code requirements. Therefore, no significant impacts from geological hazards are expected due to implementation of the 2005 Ozone Strategy.

4.4.6.1 Alternative 1 - No Project Alternative

Under the No Project Alternative, some aspects of the control measures adopted in the 2000 CAP would still be implemented. Therefore, the impacts on geology and soils under the No Project Alternative are expected to remain the same as the proposed project and are less than significant.

4.4.6.2 Alternative 2 - Transit Access and Low Emission Vehicle Emphasis Alternative

Alternative 2 would provide increased emphasis on some TCMs including TCM 3 – Improve Local and Areawide Bus Service, TCM 5 – Improve Access to Rail and Ferries, TCM 9 – Improve Bicycle Access and Facilities, TCM 19 - Improve Pedestrian Access and Facilities, and MS-1 – Diesel Equipment Idling Ordinance. The increased emphasis

on these TCMs will not alter the potential impacts on geology and soils. Therefore, the potential impacts on geology and soils under the Transit Access and Low Emission Vehicle Emphasis Alternative remain the same as the proposed project and are less than significant.

4.4.7 HAZARDS/HAZARDOUS MATERIALS

The proposed project impacts on hazards and hazardous materials were determined to be potentially significant for SS 14 – Stationary Gas Turbines due to the potential use of SCR units that utilize anhydrous ammonia. The hazards associated with other control measures including the hazards related to reformulated coatings, fuel additives, alternative fuels, and electric powered vehicles were determined to be less than significant.

4.4.7.1 Alternative 1 - No Project Alternative

Under the No Project Alternative, many of the same control measures included under the proposed project would still be implemented (see Table 4.3-1). However, SS 14 – Stationary Gas Turbines would not be included in Alternative 1 as it was not included in the 2000 CAP. Therefore, the impacts on hazards/hazardous materials under the No Project Alternative are expected to be less than significant.

4.4.7.2 Alternative 2 - Transit Access and Low Emission Vehicle Emphasis Alternative

Alternative 2 would provide increased emphasis on some TCMs including TCM 3 – Improve Local and Areawide Bus Service, TCM 5 – Improve Access to Rail and Ferries, TCM 9 – Improve Bicycle Access and Facilities, TCM 19 - Improve Pedestrian Access and Facilities, and MS-1 – Diesel Equipment Idling Ordinance. The increased emphasis on these TCMs will not alter the potential impact on hazards and hazardous materials. Therefore, the potential impacts on hazards and hazardous materials under the Transit Access and Low Emission Vehicle Emphasis Alternative remain the same as the proposed project and are potentially significant.

4.4.8 HYDROLOGY AND WATER QUALITY

The proposed project impacts on hydrology and water quality were determined to be less than significant following mitigation for: (1) the increased potential for fuel spills and water quality degradation in San Francisco Bay associated with TCM 7 – Improve Ferry Service. Although there is the potential for a spill, it was determined to be less than significant following mitigation which included a strengthened Harbor Safety Plan; reviewed and modified contingency plans, drill exercises and emergency response service agreements; educational programs for operators; and improvements in technological designs on new fleets to avoid fuel spills; and (2) potential storm water runoff associated with TCM 4 – Upgrade and Expand Local Regional Rail Service, TCM5 – Improve Access to Rails and Ferries, and TCM 7 - Improve Ferry Service.

4.4.8.1 Alternative 1 - No Project Alternative

Under the No Project Alternative, some aspects of the control measures adopted in the 2000 CAP would still be implemented. Therefore, the impacts on hydrology and water quality under the No Project Alternative are expected to remain the same as the proposed project, and are less than significant, following mitigation.

4.4.8.2 Alternative 2 - Transit Access and Low Emission Vehicle Emphasis Alternative

Alternative 2 would provide increased emphasis on some TCMs including TCM 3 – Improve Local and Areawide Bus Service, TCM 5 – Improve Access to Rail and Ferries, TCM 9 – Improve Bicycle Access and Facilities, TCM 19 - Improve Pedestrian Access and Facilities, and MS-1 – Diesel Equipment Idling Ordinance. The increased emphasis on these TCMs will not alter the potential impacts of the proposed project on hydrology and water quality. Therefore, the potential impacts on hydrology and water quality under the Transit Access and Low Emission Vehicle Emphasis Alternative remain the same as the proposed project and are less than significant, following mitigation.

4.4.9 LAND USE AND PLANNING

The proposed project impacts on land use and planning were determined to be less than significant.

4.4.9.1 Alternative 1 - No Project Alternative

Under the No Project Alternative, some aspects of the control measures adopted in the 2000 CAP would still be implemented. Therefore, the impacts on land use and planning under the No Project Alternative are expected to remain the same as the proposed project and are less than significant.

4.4.9.2 Alternative 2 - Transit Access and Low Emission Vehicle Emphasis Alternative

Alternative 2 would provide increased emphasis on some TCMs including TCM 3 – Improve Local and Areawide Bus Service, TCM 5 – Improve Access to Rail and Ferries, TCM 9 – Improve Bicycle Access and Facilities, TCM 19 - Improve Pedestrian Access and Facilities, and MS-1 – Diesel Equipment Idling Ordinance. The increased emphasis on to these TCMs is not expected to significantly alter the potential impacts on land use and planning. Under Alternative 2, there could be some changes to bus, rail and ferry terminals to make them more user friendly to pedestrian or bus activity. Changes to parking lots or structures could also occur to minimize the use of vehicles for transport to the terminals. The construction of terminal facilities require permitting by the local land use agency to determine and assure that the facilities comply with local zoning and land

use plans. Therefore, the Transit Access and Low Emission Vehicle Emphasis Alternative would have the same effect on Land Use and Planning services as the proposed project, which were less than significant.

4.4.10 NOISE

The addition of new transit lines, widening of freeways (which brings noise closer to sensitive land uses), addition of new lanes that result in high traffic volumes and speeds, and the concentration of vehicle traffic near terminals associated with TCM 4 – Upgrade and Expand Local and Regional Rail Service, TCM 5 – Improve Access to Rails and Ferries, TCM 6 - Improve Interregional Rail Service, TCM 7 – Improve Ferry Service, and TCM 8 – Construct Carpool/Express Bus Lanes on Freeways, would result in direct noise impacts (both noise and ground borne vibrations). Mitigation measures are expected to reduce the noise to acceptable noise levels.

4.4.10.1 Alternative 1 - No Project Alternative

Under the No Project Alternative, aspects of TCM 4 – Upgrade and Expand Local and Regional Rail Service, TCM 5 – Improve Access to Rails and Ferries, TCM 6 - Improve Interregional Rail Service, TCM 7 – Improve Ferry Service, and TCM 8 – Construct Carpool/Express Bus Lanes on Freeways that were approved as part of the 2000 CAP would still be implemented, and the impacts resulting from the construction of new ferry facilities as approved by the Water Transit Authority in their adopted Implementation and Operations Plan would still remain. Therefore, the potential impacts on noise under the No Project Alternative are essentially the same as the proposed project and are expected to be less than significant following mitigation.

4.4.10.2 Alternative 2 - Transit Access and Low Emission Vehicle Emphasis Alternative

Under the Transit Access and Low Emission Vehicle Alternative, TCM 4 – Upgrade and Expand Local and Regional Rail Service, TCM 5 – Improve Access to Rails and Ferries, TCM 6 - Improve Interregional Rail Service, TCM 7 – Improve Ferry Service, and TCM 8 – Construct Carpool/Express Bus Lanes on Freeways would still be implemented. Alternative 2 would provide increased emphasis on some TCMs including TCM 3 – Improve Local and Areawide Bus Service, TCM 5 – Improve Access to Rail and Ferries, TCM 9 – Improve Bicycle Access and Facilities, TCM 19 - Improve Pedestrian Access and Facilities, and MS-1 – Diesel Equipment Idling Ordinance. The increased emphasis on these TCMs is not expected to alter the impacts on noise as the transportation projects would still be constructed. Therefore, the potential impacts on noise under the Transit Access and Low Emission Vehicle Emphasis Alternative remain the same as the proposed project, and are expected to be less than significant following mitigation.

4.4.11 TRANSPORTATION AND TRAFFIC

The potential impacts of the proposed project on transportation and traffic were considered potentially significant due to increases in congestion near train stations, ferry buildings and bus stations. The potentially significant transportation and traffic impacts were associated with implementation of TCM 1 – Voluntary Employer-Based Trip Reduction Programs, TCM 3 – Improve Local and Areawide Bus Service, TCM 4 – Improve Regional Rail Service, TCM 6 – Improve Intercity Rail Service, TCM 7 – Improve Ferry Service, TCM 9 – Improve Bicycle Access and Facilities, TCM 11 – Install Freeway Traffic Management Systems, TCM 13 – Transit Use Incentives, TCM 15 – Local and Land Use Planning and Development Strategies, and TCM 20 – Promote Traffic Calming. Impacts must be determined on a case-by-case basis after mitigation measures are considered. Therefore, the impacts on traffic and parking in the vicinity of terminals remain potentially significant, following mitigation.

4.4.11.1 Alternative 1 - No Project Alternative

Under the No Project Alternative, aspects of TCM 1 – Voluntary Employer-Based Trip Reduction Programs, TCM 3 – Improve Local and Areawide Bus Service, TCM 4 – Improve Regional Rail Service, TCM 6 – Improve Intercity Rail Service, TCM 7 – Improve Ferry Service, TCM 9 – Improve Bicycle Access and Facilities, TCM 11 – Install Freeway Traffic Management Systems, TCM 13 – Transit Use Incentives, TCM 15 – Local and Land Use Planning and Development Strategies, and TCM 20 – Promote Traffic Calming that were approved as part of the 2000 CAP would still be implemented, and the impacts resulting from the implementation of the Water Transit Authority's adopted Implementation and Operations Plan would still remain. Therefore, the potential significant impacts on transportation and traffic under the No Project Alternative remain the same as the proposed project.

4.4.11.2 Alternative 2 – Transit Access and Low Emission Vehicle Emphasis Alternative

Under the Transit Access and Low Emission Vehicle Alternative, the TCMs that could generate potentially significant transportation and traffic impacts would still be implemented. However, more emphasis would be placed on other control measures, including TCM 3 – Improve Local and Areawide Bus Service, TCM 5 – Improve Access to Rail and Ferries, TCM 9 – Improve Bicycle Access and Facilities, TCM 19 - Improve Pedestrian Access and Facilities, and MS 1 – Diesel Equipment Idling Ordinance. It is expected that with more emphasis, early implementation, increased parking fees or other actions to help ensure the effectiveness of these TCMs, the potential for significant transportation and traffic impacts would be reduced from the proposed project. The extent to which this alternative would actually reduce traffic is unknown, so the transportation and traffic impacts are expected to remain the same as the proposed project, potentially significant.

4.4.12 UTILITIES AND SERVICE SYSTEMS

The potential impacts of the proposed project on utilities and service systems were considered potentially significant for energy impacts due the use of petroleum fuels associated with TCM 7 - Improve Ferry Service. The impact could be reduced with implementation of the mitigation measures, however, the effectiveness of the mitigation measures cannot be quantified at this time. Therefore, this impact remains potentially significant.

No significant adverse impacts were identified for increases in electricity, natural gas, solid/hazardous waste facilities, or water use associated with the 2005 Ozone Strategy.

4.4.12.1 Alternative 1 - No Project Alternative

Under the No Project Alternative, aspects of TCM 7 – Improve Ferry Service that were approved as part of the 2000 CAP would still be implemented, and the impacts resulting from the implementation of the Water Transit Authority's adopted Implementation and Operations Plan would still remain. Therefore, the potential significant impacts on utilities and service systems under the No Project Alternative remain the same as the proposed project.

4.4.12.2 Alternative 2 – Transit Access and Low Emission Vehicle Emphasis Alternative

Under the Transit Access and Low Emission Vehicle Alternative, TCM 7 – Improve Ferry Service would be implemented so the potential for significant impacts on energy would remain. However, more emphasis would be placed on other control measures, including TCM 3 – Improve Local and Areawide Bus Service, TCM 5 – Improve Access to Rail and Ferries, TCM 9 – Improve Bicycle Access and Facilities, TCM 19 - Improve Pedestrian Access and Facilities, and MS-1 – Diesel Equipment Idling Ordinance. It is expected that with more emphasis, early implementation, increased parking fees or other actions to help ensure the effectiveness of TCMs 3, 5, 9, 19, and MS-1, there would be reduced traffic and potentially reduced use of petroleum resources. The extent to which this alternative would actually reduce the use of petroleum resources is unknown so the utilities and service system impacts are expected to remain significant.

4.5 COMPARISON

Pursuant to CEQA Guidelines §15126.6(d), an EIR should include sufficient information about each alternative to allow meaningful comparison with the proposed project. Section 15126.6(d) also recommends the use of a matrix to summarize the comparison. Table 4.5-1 provides this matrix comparison. The No Project Alternative would not ultimately achieve the long-term benefits of the 2005 Ozone Strategy, and is not a legally viable alternative as it would violate portions of the CCAA.

Under Alternative 2, Transit Access and Low Emission Vehicle Alternative, the potential significant air quality and transportation and traffic impacts associated with the proposed project could be reduced. However the level to which the air quality impacts and transportation and traffic impacts could be reduced is unknown at this time and these impacts are expected to remain the same as those identified for the proposed project. The proposed project is considered to be the environmentally superior alternative because implementation of the control measures in the 2005 Ozone Strategy will provide more ozone precursor emission reductions than the emission reductions that could be expected with the no project alternative. Therefore, the proposed project, which addresses the CCAA's legal mandate that the District adopt "all feasible measures," is the preferred alternative.

TABLE 4.5-1

Comparison of Alternatives

ENVIRONMENTAL RESOURCE	Proposed Project	Alternative 1	Alternative 2
Aesthetics	PS	PS	PS
Agricultural Resources	NS	NS	NS
Air Quality	PS	PS	PS
Biological Resources	PS	PS	PS
Cultural Resources	PS	PS	PS
Geology and Soils	NS	NS	NS
Hazards and Hazardous Materials	PS	NS	PS
Hydrology and Water Quality	MNS	MNS	MNS
Land Use and Planning	NS	NS	NS
Mineral Resources	NS	NS	NS
Noise	MNS	MNS	MNS
Population and Housing	NS	NS	NS
Public Services	NS	NS	NS
Recreation	NS	NS	NS
Traffic and Transportation	PS	PS	PS
Utilities and Service Systems	PS	PS	PS

NS = Not Significant Impact
MNS = Mitigated to Not Significant Impact
PS = Potentially Significant Impact

CHAPTER 5

OTHER CEQA TOPICS

Relationship Between Short-Term and Long-Term Productivity
Significant Irreversible Environmental Changes
Growth-Inducing Impacts

5.0 OTHER CEQA TOPICS

5.1 RELATIONSHIP BETWEEN SHORT-TERM AND LONG-TERM PRODUCTIVITY

An important consideration when analyzing the effects of a proposed project is whether it will result in short-term environmental benefits to the detriment of achieving long-term goals or maximizing productivity of these resources. Implementing the 2005 Ozone Strategy is not expected to achieve short-term goals at the expense of long-term environmental productivity or goal achievement. The purpose of the 2005 Ozone Strategy is to set forth a comprehensive control program that demonstrates that the Bay Area will make progress towards attaining the State one-hour ozone standard. By showing progress toward attainment of the State ambient air quality standards, the Strategy is expected to enhance short and long-term environmental productivity in the region.

Implementing the 2005 Ozone Strategy does not narrow the range of beneficial uses of the environment. Of the potential environmental impacts discussed in Chapter 3, those related to aesthetics, air quality, biological resources, cultural resources, transportation and traffic, and utilities and service systems are considered potentially significant following mitigation. Implementation of the recommended mitigation measures will ensure such impacts are mitigated to the greatest degree feasible.

Because no short-term environmental benefits are expected at the expense of achieving long-term environmental goals, there is no justification for delaying the proposed action. This project needs to be implemented as the BAAQMD is required by the CCAA to formally adopt a triennial update to the region's strategy for achieving the State ambient air quality standards. The BAAQMD is proceeding with the 2005 Ozone Strategy pursuant to this mandate.

5.2 SIGNIFICANT IRREVERSIBLE ENVIRONMENTAL CHANGES

CEQA requires an EIR to discuss significant irreversible environmental changes which would result from a proposed action should it be implemented. Irreversible changes include a large commitment of nonrenewable resources, committing future generations to specific uses of the environment (e.g., converting undeveloped land to urban uses), or enduring environmental damage due to an accident.

Implementation of the 2005 Ozone Strategy is not expected to result in significant irreversible adverse environmental changes. The Strategy would place only an incremental demand on nonrenewable and limited resources, such as energy and water supplies, relative to the accelerated rate of use of these resources due to population growth and increased consumer demand. The largely irretrievable conversion of

undeveloped/agricultural land to urban uses is a function of the growing population and local land use authority, not the 2005 Ozone Strategy.

Some of the control measures in the Strategy could result in potentially significant impacts to aesthetics, localized air quality, biological resources, cultural resources, transportation, and public utilities and service systems. The extent of these potential impacts could not be fully analyzed due to the lack of specificity of the control measures and the uncertainty of their implementation. Mitigation measures have been identified that could minimize these potentially significant impacts. However, additional project level analysis is required to determine if these potential impacts are significant and if there are feasible mitigation measures available to reduce the impacts to less than significant.

The 2005 Ozone Strategy is expected to result in long-term benefits associated with improved air quality even though the population of the Bay Area is expected to increase. The project would result in reduced emissions of ozone precursors, thereby improving air quality and related public health. Reduced ozone air pollution would also directly improve the vitality of crops and other plants, and the related health of livestock, domestic animals and wildlife. Ozone damage to structures and materials would also be diminished.

5.3 GROWTH-INDUCING IMPACTS

A growth-inducing impact is defined as the "ways in which the proposed project could foster economic or population growth, or the construction of additional housing, either directly or indirectly, in the surrounding environment." Growth-inducing impacts can generally be characterized in three ways. In the first instance, a project is located in an isolated area and brings with it sufficient urban infrastructure to result in development pressure being placed on the intervening and surrounding land. This type of induced growth leads to conversion of adjacent acreage to higher intensity uses because the adjacent land becomes more conducive to development and, therefore, more valuable because of the availability of the extended infrastructure.

A second type of growth-inducing impact is produced when a large project, relative to the surrounding community or area, affects the surrounding community by facilitating and indirectly promoting further community growth. The additional growth is not necessarily adjacent to the site or even of the same land use type as the project itself. A project of sufficient magnitude can induce growth in a community that could alter a community's size and character significantly.

A third and more subtle type of growth-inducing impact occurs when a new type of development is allowed in an area, which then subsequently establishes a precedent for additional development of a similar character (e.g., a new university is developed which leads to additional educational facilities, research facilities and companies, housing, commercial centers, etc.)

None of the above scenarios characterize the project in question. The control measures contained in the 2005 Ozone Strategy accommodate the projected growth for the region – they are not the cause of residential, commercial, industrial, and infrastructure development. The Strategy may indirectly increase the efficiency of the region's urban form through encouraging more air quality efficient development patterns as the Strategy does seek to influence land use, e.g., TCM 15 – Local and Land Use Planning and Development Strategies. The 2005 Ozone Strategy does not change jurisdictional authority or responsibility concerning land use or property issues (Section 40716 of the California Health and Safety Code) and, therefore, is not considered to be growth-inducing.

It should be noted that there are secondary, positive growth-inducing impacts that could result from the implementation of the 2005 Ozone Strategy. As air quality improves, the Bay Area could become a more attractive, healthful place to live, which could encourage additional migration to the region. However, it is not possible to predict whether this would occur, nor the extent to which this would occur. As further analysis would be speculative, this topic is not further discussed.

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CHAPTER 6

REFERENCES

References
Organizations and Persons Consulted

6.1 REFERENCES

BAAQMD, 2000. Final Addendum to the 1991 Clean Air Plan Environmental Impact Report, Prepared for the 2000 CAP, December 20, 2000.

BAAQMD, 2001. Revised 2001 San Francisco Bay Area Ozone Attainment Plan for the 1-hour National Ozone Standard, adopted October 24, 2001.

BAAQMD, 2002. 2002 BAAQMD Ambient Air Quality Data.

BAAQMD, 2005. Toxic Air Contaminant Control Program Annual Report 2002 Volume I. June 2004.

California Air Resources Board (CARB), 2000. Draft Program Environmental Impact Report, Suggested Control Measure for Architectural Coatings. California Air Resources Board, February 2000.

CARB, 2000. Risk Reduction Plan to Reduce Particulate Matter Emissions from Diesel-Fueled Engines and Vehicles. Stationary Source Division, Mobil Source Control Division, October 2000.

CARB, 2001. Ozone Transport: 2001 Review. California Air Resources Board, April 2001.

CARB (California Air Resources Board), 2002. Proposed Clean Air Plan. Volume I – Basis and Impacts.

CARB, 2003. The Ozone Weekend Effect in California, Technical Support Document, The Planning and Technical Support Division, May 30, 2003.

California Energy Commission (CEC), 2001 California 2001 Electric Utility Retail Deliveries. http://www.energy.ca.gov/electricity/utility_sales.html

California Independent System Operator (CAISO, 2005). Update to Action Plan for San Francisco, Memorandum to CAISO Operations Committee, June 8, 2005.

California Integrated Waste Management Board, 2002

California Integrated Waste Management Board, Solid Waste Information System (SWIS), July 2004. http://www.ciwmb.ca.gov/SWIS

Caltrans, 2003. California Motor Vehicle Stock, Travel and Fuel Forecast. California Department of Transportation, Division of Transportation System Information, November 2003.

CEC/CARB, 2002 California Energy Commission and California Air Resources Board, Task 3 Petroleum Reduction Options, Staff Draft Report, March, 2002. http://www.energy.ca.gov/reports/2002-03-19_600-02-011D.PDF

CEC, 2002 California Utility Electricity Deliveries by County for 2002. http://www.energy.ca.gov/electricity/electricity_by_county_2000.html

CEC, 2002a. Major Sources of Energy. December, 2003. http://www.energy.ca.gov/html/energysources.html

CEC, 2003. Electricity and Natural Gas Assessment Report. http://www.energy.ca.gov/reports/100-03-014F.PDF

CEC, 2004. http://www.energy.ca.gov/electricity/WECC_PROPOSED_GENERATION.XLS

Regional Water Quality Control Board, 1995. Water Quality Control Plan, San Francisco Bay Basin (Region 2), California Regional Water Quality Control Board, San Francisco Bay Region, June 21, 1995.

Governor's Office of Emergency Services (OES), 2001. Hazardous Materials Spill Reports.

International Center for Technology Assessment (ICTA), ICTA 1996. The Environmental Impacts and Safety of Electric Vehicles, ICTA Report Series – Report No. 2.

MECA (Manufacturer's of Emission Controls Association), 1999. Demonstration of Advanced Emission Control Technologies Enabling Diesel-Powered Heavy-Duty Engines to Achieve Low Emission Levels, June, 1999.

Metropolitan Transportation Commission (MTC). (2001). 2001 Regional Transportation Plan Environmental Impact Report, State Clearinghouse (No. 2001032141).

Norfleet Consultants, 1998. Groundwater Study and Water Supply History of the East Bay Plain, Alameda and Contra Costa Counties, prepared for The Friends of the San Francisco Estuary, June 15, 1998.

NTS (National Technical System), 1999. The Preliminary Test Data/Project Status Report #3, NTS, April 5, 1999.

Pacific Gas & Electric (PG&E), 2005. Hunters Point Power Plant Update, January, 2005.

San Francisco, County of, 2004. County web site. http://temp.sfgov.org/sfenvironment/aboutus/school/fact_sheets/c1.pdf

San Francisco Estuary Institute, 2004. Pulse of the Estuary 2004.

San Francisco Estuary Project, 2004. San Francisco Estuary Project web page, reports and publications. www.abag.gov/bayarea/sfep/reports/fact/pollute.html.

Sonoma Technology, Inc., 2002. Weekday/Weekend Ozone Observations in the South Coast Air Basin, Volume III: Analysis of Summer 2000 Field Measurements and Support Data. Final Report. April 29, 2002.

South Coast Air Quality Management District (SCAQMD), 2003. Final Draft Program Environmental Impact Report for 2003 AQMP, State Clearinghouse No. 2002081137, August 2003.

U.S. Geological Survey (USGS), 2004. California Earthquake History 1769 – Present. http://pasadena.wr.usgs.gov/info/cahist_eqs.html

U.S. Census Bureau, 2004. Population Data Estimates. www.census.gov.

Water Transportation Authority, 2003. Final Program Environmental Impact Report, Expansion of Ferry Transit Service in the San Francisco Bay Area, June 2003, SCH No. 2001112048

Yolo-Solano AQMD, 2001. Rule 2.14 Architectural Coatings EIR, State Clearinghouse No. 2001062066.

6.2 ORGANIZATIONS AND PERSONS CONSULTED

The CEQA statues and Guidelines require that organizations and persons consulted be provided in the EIR. A number of organizations, state and local agencies, and private industry have been consulted. The following organizations and persons have provided input into this document.

Organizations

California Air Resources Board
Metropolitan Transportation Commission
Water Transit Authority

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CHAPTER 7

ACRONYMS

7.0 ACRONYMS

ABBREVIATION	DESCRIPTION
AAQS	Ambient Air Quality Standard
AB	Assembly Bill
ABAG	Association of Bay Area Governments
AB1807	California Toxic Air Contaminants Program (Tanner Bill)
AB2728	Revised Tanner Bill
AB2588	Air Toxic "Hot Spots" Information and Assessment Act
AB2595	California Clean Air Act
ACE2588	Assessment of Chemical Exposure for AB2588
ADT	Average Daily Traffic
AEL	Acute Exposure Limit
AER	Annual Emission Reporting
AFV	Alternative Fuel Vehicles
AHM	Acutely Hazardous Material
API	American Petroleum Institute
AQIP	Air Quality Investment Plan
ARB	Air Resources Board
ASC	Area Source Credits
ASTM	American Society for Testing and Materials
ATCM	Airborne Toxic Control Measure
ATIR	Air Toxics Inventory Report
ATT	Advanced Transportation Technology
AVR	Average Vehicle Ridership
AWT	Advanced Water Treatment
BAAQMD	Bay Area Air Quality Management District
BACT	Best Available Control Technology
BACM	Best Available Control Measures
BAR	Bureau of Automotive Repair
BARCT	Best Available Retrofit Control Technology
BCM	Best Available Control Measures for Fugitive Dust Sources
BMP	Best Management Practices
BPTCP	Bay Protection and Toxic Clean Up Plan
BTU	British Thermal Units
BTU/hr	British Thermal Units per hour
CAA	Clean Air Act
CAAA	Clean Air Act Amendments
Caltrans	California Department of Transportation
CalOSHA	California Occupational Safety and Health Administration
CAPCOA	California Air Pollution Control Officers Association
CARB	California Air Resources Board
CCAA	California Clean Air Act
CCOS	Central California Ozone Study

CCR	California Code of Regulations
CDFC	California Department of Fish and Game
CDWR	California Department of Water Resources
CEC	California Energy Commission
CEMS	Continuous Emissions Monitoring System
CEQA	California Environmental Quality Act
CFCs	Chloroflorocarbons
CFR	Code of Federal Regulations
CH4	Methane
CHMIRS	California Hazardous Materials Incident Reporting System
CHP	California Highway Patrol
CIWMB	California Integrated Waste Management Board
CMA	Congestion Management Agencies
CNEL	community noise equivalent level
CNG	Compressed Natural Gas
CNS	Central nervous system
CO	carbon monoxide
CO_2	carbon dioxide
COD	Chemical Oxygen Demand
CPUC	California Public Utilities Commission
CUP	Conditional Use Permit
CVP	Central Valley Project
CWA	Clean Water Act
CWAP	Clean Water Action Plan
CWMI	Chemical Waste Management Inc.
C4	Butane
dBA	decibel
DHS	Department of Health Services
DLM	Dry Low NOx
DMV	Department of Motor Vehicles
DOC	Diesel Oxidation Catalyst
DOT	Department of Transportation
DPR	Department of Pesticide Regulation
DTSC	California Environmental Protection Agency, Department of Toxic Substances Control
DTIM	Direct Travel Impact Model
DWR	California Department of Water Resources
ERC	Emission Reduction Credit
EB	Electron Beam
EGR	Exhaust Gas Recirculation
EHS	Extremely Hazardous Substance
EIP	Economic Incentive Program
EIR	Environmental Impact Report
EIS	Environmental Impact Statement
EPCRA	USEPA's Emergency Planning and Community Right-to-Know

ERPG	Emergency Response Planning Guideline
ESP	Electrostatic Precipitators
^{o}F	Degrees Fahrenheit
FBI	Federal Bureau of Investigation
FEMA	Federal Emergency Management Agency
FGR	flue gas recirculation
FHWA	Federal Highway Administration
FIP	Federal Implementation Plan
FR	Federal Register
G	acceleration of gravity
g/l	grams per liter
GLM	Ground Level Monitors
GWRS	Groundwater Replenishment System
H_2	Hydrogen
H_2SO_4	Sulfuric Acid
HAP	Hazardous Air Pollutants
HAZOP	hazards and operation process
HCFs	Hydrochlorofluorcarbons
HDV	Heavy Duty Vehicles
HEPA	High-Efficiency Particulate Air
HEV	Hybrid Electric Vehicles
HHV	Higher Heating Value
HMBP	Hazardous Materials Business Plan
HNO_3	Nitric Acid
HOV	High Occupancy Vehicle
HRA	Health Risk Assessment
HSWA	Hazardous and Solid Waste Act
HMTA	Hazardous Materials Transportation Act
HWCL	Hazardous Waste Control Law
I&M	Inspection and Maintenance
ICAO	International Civil Aviation Organization
ICE	Internal Combustion Engine
ICTA	International Center for Technology Assessment
ISCST3	Industrial Source Complex Model Short Term Version 3
ISO	Independent System Operator
ISTEA	International Surface Transportation Efficiency Act
ITS	Intelligent Transportation Systems
kWh	Kilowatt Hour
^{o}K	degrees Kelvin
LACSD	Los Angeles County Sanitation District
LAER	lowest achievable emission reduction
lbs	pounds
lbs/hr	pounds per hour
LEL	lower explosive limit
LEM	Location Efficient Mortgage

LEV	Low Emission Vehicle
LOS	Level of Service
LPG	liquefied petroleum gas
Lpk	Peak sound level
MACT	Maximum Achievable Control Technologies
MCL	Maximum Contamination Level
MATES	Multiple Air Toxic Exposure Study
MBAS	Methylene Blue Active Substances
MECA	Manufacturer's of Emission Controls Association
MEI	maximum exposed individual
MEIR	maximum exposed individual resident
MEIW	maximum exposed individual worker
MEK	Methyl Ethyl Ketone
MICR	Maximum Increased Cancer Risk
MMBD	Million Barrels Per Day
Mmcfd	Million Cubic Feet per Day
MOU	Memo of Understanding
MSDS	Material Safety Data Sheet
MSERC	Mobile Source Emission Credit
MSIP	Mobile Source Emission Reduction Incentive Program
MSW	Municipal Solid Waste
MTBE	methyl tertiary butyl ether
MTC	Metropolitan Transportation Commission
MTM	Mid-Term Control Measures
mw	megawatts
m/s	meters per second
N_2	nitrogen
NAAQS	National Ambient Air Quality Standards
NAFTA	North American Free Trade Agreement
NAMS	National Air Monitoring Stations
nanograms/m^3	nanograms per cubic meter
NEC	National Electric Code
NESHAPS	National Emission Standards for Hazardous Air Pollutants
NPDES	National Pollutant Discharge Elimination System
NFPA	National Fire Protection Agency
NH_3	Ammonia
NIOSH	National Institute of Occupational Safety and Health
NO	Nitric Oxide
NO_2	Nitrogen Dioxide
NOP	Notice of Preparation
NOP/IS	Notice of Preparation/Initial Study
NOI	Notice of Intent
NOV	Notice of Violation
NOx	nitrogen oxide
NPDES	National Pollutant Discharge Elimination System

NS	No significant impacts
NSPS	New Source Performance Standards
NSR	New Source Review
NTS	National Technical System
O_3	Ozone
OAP	Ozone Attainment Plan
OBD	On-Board Diagnostic Program
OEHHA	Office of Environmental Health Hazards Assessment
OEM	Original Equipment Manufacturer
OES	Office of Emergency Services
OSHA	Occupational Safety and Health Administration
PAHs	Polynuclear Aromatic Hydrocarbons
PCBF	Perchlorobenzotrifluoride
PCBs	Polychlorinated Biphenyls
PCBTF	p-chlorobenzotriflouride
PCE	passenger car equivalents
PEM	Proton Exchange Membrane
PG&E	Pacific Gas and Electric Company
pH	potential hydrogen ion concentration
PM10	particulate matter less than 10 microns equivalent aerodynamic diameter
PM2.5	particulate matter less than 2.5 microns equivalent aerodynamic diameter
POTW	Publicly Owned Treatment Works
Ppb	parts per billion
ppbv	parts per billion by volume
pphm	parts per hundred million
ppm	parts per million
ppmv	parts per million by volume
PRD	Pressure Relief Devices
PSD	Prevention of Significant Deterioration
psi	pounds per square inch
psia	pounds per square inch absolute
psig	pounds per square inch (gauge)
PSM	Process Safety Management Program
PTFE	Polytetrafluoroethylene
PX	Power Exchange
RCPG	Regional Comprehensive Plan and Guide
RCRA	Resource Conservation and Recovery Act
REL	Reference exposure level
RFP	Reasonable Further Progress
RFG	reformulated fuels gasoline
RMP	Risk Management Program
RMPP	Risk Management and Prevention Program
ROC	Reactive Organic Compound

ROG	Reactive Organic Gases
RPS	Renewable Portfolio Standard
RRMP	Redesignation Request and Maintenance Plan
RTIP	Regional Transportation Implementation Plan
RTP	Regional Transportation Plan
RVP	Reid Vapor Pressure
RWQCB	Regional Water Quality Control Board
SAE	Society of Automotive Engineers
SARA	Superfund Amendments and Revitalization
SB	Senate Bill
SCAQMD	South Coast Air Quality Management District
SCE	Southern California Edison Company
SCR	Selective Catalytic Reduction
SCS	Soil Conservation Service
SIP	State Implementation Plan
SLAMS	State and Local Air Monitoring Stations
SMCL	Secondary Maximum Contaminant Level
SNCR	Selective Non-Catalytic Reduction
SO_2	sulfur dioxide
SO_3	Sulfur Trioxide
SOFC	Solid Oxide Fuel Cell
SOx	sulfur oxide
SPCC	Spill Prevention, Control and Countermeasure
SPM	Special Purpose Monitor
SSCOT	State Standing Committee on Terrorism
SULEV	Super Ultra Low Emission Vehicle
SWP	State Water Project
SWMPS	Storm Water Management Plan
SWPPP	Stormwater Pollution Prevention Plan
SWRCB	State Water Resources Control Board
TACs	toxic air contaminants
TAF	thousand acre feet
TAO	Technology Advancement Office
TCM	Transportation Control Measure
TCE	Trichloroethylene
Tcf	trillion cubic feet
TDM	transportation demand management
TDS	total dissolved solids
TEA	Transportation Equity Act
TFCA	Transportation Fund for Clean Air
TIMP	Transportation Improvement and Mitigation Program
TMA	Transportation Management Association
TMDL	Total Maximum Daily Loads
TOG	Total Organic Gases
TPA	Transportation Planning Agency

TPD	Tons per Day
TPH	total petroleum hydrocarbons
TPY	Tons per Year
TSP	Total Suspended Particulate
TSS	Total Suspended Solids
ULEV	Ultra Low Emission Vehicle
ULF	Ultra Low Flush
U.S.	United States
USBR	United States Bureau of Reclamation
USDOT	United States Department of Transportation
U.S. EPA	United States Environmental Protection Agency
USC	United States Code
USCG	United States Coast Guard
ug/l	micrograms per liter
ug/m^3	micrograms per cubic meter
UV	Ultra Violet
UWA	Unified Watershed Assessment
V/C	volume to capacity ratio
VIP	Vehicle Inspection Program
VMT	Vehicle Miles Traveled
VOC	volatile organic compounds
volatiles	purgeable organics
WDR	Waste Discharge Requirements
WRD	Water Replenishment District
WST	Waste Related Measures
WTA	Water Transit Authority
ZEV	Zero Emissions Vehicles